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THE IMPORTANCE OF DETAIL IN THE ART OF THE CARE OF THE PATIENT*

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ANYONE receiving an invitation to deliver one of The Care of the Patient Lectures cannot fail to experience certain very distinct reactions. In the first place, one is honored by the invitation to address the student body of the Harvard Medical School and also by being permitted to join the list of those who have delivered the lectures which form this unique and famous series. In addition, one cannot fail to feel that one's selection carries another compliment in that it implies that one is considered to be a person interested in the care of the patient and all that is meant by that phrase. This compliment, it seems to me, should be preferred above all others by a clinician.

The invitation to speak on the care of the patient acts as a stimulus in another way and produces a second reaction, which is not so pleasant as the first. It forces one to formulate one's ideals for the care of the patient and to analyze one's own behavior in this matter. This is a healthful thing for anyone to do, but I fear that, in every honest instance, it leads to a sense of disappointment and humility when one realizes how far one's deeds fall short of one's intentions.

Let me assure you that the present speaker has reacted to the invitation with both the pleasant and the unpleasant emotions. I was very appreciative of the honor of the invitation, but when I then catechized myself concerning what I felt the physician owed to the patient in the way of care, I was pained to realize that in practice I had fallen very short of this goal. Perhaps I might comfort myself with the thought that the standard which I was setting for ideal care was very high and that it was excusable for anyone to fail to reach such a level of achievement. Unfortunately, this excuse is not valid for, after I had analyzed my beliefs in the matter, I found that I had come to the conclusion that the care of the patient in its every aspect is inherently a part of our job and that success calls for an infinite attention to detail which is possible for each of us, although difficult for many, just as much as it calls for qualities of character with which some of us might not be so well endowed. This is the view of the care of the patient which I wish to present to you; it may not seem to be an emotional or inspiring approach but it makes the care of the patient an everyday routine matter and an integral part of our duty as physicians. This in itself is, it seems to me, the most inspiring aspect of the matter.

Before developing this thought any further, let us look back over the lectures given in this series in previous years and see what aspects of the subject were chosen for discussion. Naturally, no two men would present the matter from exactly the same angle. Fortunately, a number of the previous lectures are available in print, and I have been able to review some ten of them. I think it may interest you if I should briefly mention some of these previous lectures and attempt to convey to you the speakers' conception of the meaning, significance and purpose of the phrase, the care of the patient.

Eight of the lectures have been collected and published in a book entitled "Physician and Patient," while another of the lectures, that by Dr. Francis W. Peabody, has been published in the *Journal of the American Medical Association* (88: 77 [Mar. 19] 1927), in a small booklet under the title "The Care of the Patient" and among other papers in a book entitled "Doctor and Patient." Still others have been published in full or in abstract in *The New England Journal of Medicine*.

About ten years ago Dr. David L. Edsall, former dean of your school, delivered what must have been one of the first of these lectures. He chose for his title "Some of the Human Relations of Doctor and Patient." A brief quotation will help to give you an idea of his approach to the subject:

"On one of my visits to Johns Hopkins I made the Ward Rounds with Osler and his students. We spent a few moments at the bedside of an advanced gastric carcinoma, and as we walked on, Osler with characteristic mixture of whimsicality and seriousness suddenly caught the arm of the student and said, 'Tell me what can put forty pounds on a patient with cancer of the stomach?' Hopelessly puzzled, the student said he did not know. 'An optimistic consultant,' said Osler."

*Lecture on "The Care of the Patient," given at the Harvard Medical School, January 19, 1937.

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It was the next year that Francis Peabody delivered what has become the best known of this series of lectures, and it is one which should be read by everyone going into medicine or into any of its allied fields in which one deals with human individuals. Francis Peabody was not only a wonderful clinician but a wonderful teacher, and it was a great loss to medicine and to the Harvard Medical School when he died at such an early age. The theme of his lecture can be learned from the following quotation:

"When a patient enters a hospital, the first thing that commonly happens to him is that he loses his personal identity. He is generally referred to, not as Henry Jones, but as 'that case of mitral stenosis in the second bed on the left.' There are plenty of reasons why this is so, and the point is, in itself, relatively unimportant; but the trouble is that it leads, more or less directly, to the patient being treated as a case of mitral stenosis and not as a sick man. The disease is treated, but Henry Jones, lying awake nights while he worries about his wife and children, represents a problem that is much more complex than the pathologic physiology of mitral stenosis, and he is apt to improve very slowly unless a discerning intern discovers why it is that even large doses of digitalis fail to slow his heart rate. Henry happens to have heart disease, but he is not disturbed so much by dyspnea as he is by anxiety for the future, and a talk with an understanding physician who tries to make the situation clear to him, and then gets the social-service worker to find a suitable occupation, does more to straighten him out than a book full of drugs and diets."

The closing words of his lecture were, "One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient."

The next year the lecture was delivered by Dr. Charles F. Martin, the dean of McGill University Faculty of Medicine, under the title "The Care of the Patient: Its Psychological Aspects." He quotes Osler as saying, "A physician may possess the science of Harvey and the art of Sydenham and yet there may be lacking in him those finer qualities of heart and head which count for so much in life." It is for the want of these qualities, said the older Rolleston, that great men are not always wise; and the same thought has been expressed in the epigram that to make a successful practitioner one needs one-quarter savoir and three-quarters savoir faire.

In 1928, Dr. William S. Thayer, the great clinician of Johns Hopkins, who carried on the Osler tradition there, gave one of the lectures in this series on "The Medical Education of Jones," a most delightful description of how a fictitious young man named Jones, who may well have been Thayer himself, was brought to the realization of what medicine really stands for by an older doctor, who is given in Thayer's lecture the fictitious name of Doctor Fowler. It is easy enough to see who Fowler really was, for his every action and phrase were those of William Osler, and those of you who know French will easily recognize in the name Fowler a translation of the word from which the name Osler was, of course, derived. It is interesting how often Osler has been chosen as the exemplar of perfection in the care of the patient. This is not mere chance, for Osler's success in that field was astonishing, and it was much the same qualities of character which endeared him to every student and practitioner with whom he came in contact to an equal extent as with patients and friends.

The next lecture apparently was by Dr. Austen F. Riggs, so well known to many sufferers from nervous ailments. He spoke on "The Significance of Illness," stressing the fact that the one primary fundamental essential in the care of the patient is to understand him and his life in terms of human needs and not to treat him as just the incidental locus of a disease.

A somewhat similar approach was taken in the next lecture by Dr. Franklin G. Balch who spoke on "Some Psychological Observations by a Surgeon."

The sixth lecture in the book, "Physician and Patient," is one given by Dr. Lawrence K. Lunt on the subject of "Human Nature and Its Reaction to Suffering." He quotes Marcus Aurelius to the effect that, "It is man's special gift to love even those who fall into blunders, it operates as soon as it suggests that men are your brothers. Men exist for one another, teach them then to bear with them." There is a philosophy for us that embraces tolerance, sympathy, patience and understanding in the care of our patients. Are there any better precepts?

The final three lectures in the book are by Dr. Alfred Worcester. These concern "The Care of the Aged," "The Care of the Dying" and "Attention to Personality in Sex Hygiene." There is much that is quotable in these lectures, but I have chosen the following paragraph:

"In the past I have maintained that a young woman's fitness for the nurse's calling can be determined by the reaction of babies to her care of them. In like manner, I maintain that a young physician's fitness can be gauged by the reaction of his aged patients as it is evoked in his care of them. No surer measure can be found of his tact and courtesy, of his sympathy and devotion. These are the indispensable qualifications of the physician."

Another of the series is that by Dr. James D. Heard on "The Care of the Patient: the Art of Medicine." Later lectures include that by

Dr. Stephen Rushmore on "The Care of the Patient as the Religion of the Physician," which was published in *The New England Journal of Medicine* (**211**: 1081 [Dec. 13] 1934), and other lectures have been given in recent years by Dr. Arthur R. Crandell and Dr. David D. Scannell. Unfortunately, the list is not complete, but it will do to illustrate how similarly these speakers, who are from different parts of the country and who have different special interests, approach the problem of speaking on the subject of the care of the patient. If you read the lectures in full, you can see that, in every instance, each man stresses the necessity of sympathy, humanity and understanding for the successful care of the sick individual. It almost seems as though these lecturers were defining the perfect character more than the efficient physician, and they all draw a line between the application of medical knowledge for the cure of a disease, on the one hand, and the manifestation of fine character in the comforting of the sick person's mind and soul, on the other.

Each of these lectures is interesting and inspiring, and each of you would do well to read them and to think over the morals which they convey. You will certainly be stimulated to hope that you possess the qualities enumerated and to try to increase your own powers of sympathy, understanding, kindliness and charity. You will inevitably determine to emulate those who have been the great exemplars of the art of caring for the patient.

You will notice that I say the art of the care of the patient. There was a day, not so very long ago, when everyone stressed the fact that medicine was an art—the art of diagnosis and the art of treatment. Little by little a shift has crept in—more science, less art. Today it is more common to speak of the science of medicine, although no one who deals with sick persons will ever admit that medicine has ceased or ever will cease to be an art no matter how much science is employed in its practice.

The care of the patient, on the other hand, continues to be largely art and not science, although even this statement needs qualifying, as psychology and psychiatry teach us accurate methods of dealing with problems in these fields. Even here, science is entering into what has hitherto been instinctive art.

Now, called upon in turn to address you on this subject and to express my own credo, I find myself preparing to stress the importance of detail in the care of the patient. I am not in any sense belittling the broad fundamental points of view presented by previous lecturers but am accepting them as inherently true and obvious. I am merely going a step farther and stressing the need of attention to detail even in this division of medicine which we call the art of the care of the patient. As science has entered more and more into medicine, the importance of attention to detail has multiplied—no one would question this in the field of diagnosis or of treatment, for these are highly scientific matters today. But where art prevails there is often a mistaken belief by those who are ignorant of that special art that detail and technic are not necessary for success.

Just think of the art of painting or of writing or of anything else. The skilled make their achievements look so easy that the rest of us either think that it is an inborn gift or else that it is as easy as it looks. So we buy ourselves a box of paints, brushes and sheets of fair paper, and in a short time we come to the conclusion that the other fellow has a gift—for we cannot make the paints behave. Or in writing, however satisfied we are with the resonances of our sentences, the editors are peculiarly unimpressed and back come the manuscripts, but only if we enclosed return postage which seemed so ridiculous at the time of mailing. We forget the years of training, the slow fruition of skill until performance becomes facile.

The old adage that genius is a capacity for taking infinite pains applies in the fields of art except so very occasionally that you and I need not worry lest we overlook such an inborn power in ourselves. All of this leads up to the conclusion that there is no real difference between these arts and that of the care of the patient. A man such as Osler made it look so easy that you felt that it came without effort and was merely the reflection of his own nature. I do not mean to say that such men do not have the character and qualities which the various speakers have praised in these lectures, but I feel sure that there is more to it than that. Such men have put in their apprenticeship, have acquired technic, have learned to give attention to the details necessary in the art of the care of the patient, just as have the great artists of music and painting. For example, Osler was very careful and detailed in the examinations which he made of patients. It was he who coined the definition, "The rectal examination? Oh, that is the part of the examination left for the consultant to do." I believe that the same attention to detail played a part in his success with his patients, which seemed to be wholly spontaneous and due to his human qualities.

Before going on to any specific examples of how the care of the patient is made up of apparently trivial details, it is necessary to point out one of the difficulties which one meets as soon as one tries to come down to details. The difficulty arises from the question of where one should draw the line between the cure of the patient's disease and the care of the patient. Of course, it is only a verbal quibble and depends in the final analysis upon what meaning one attaches to two words—cure and care.

Perhaps one should not, and cannot, draw a line between the cure and the care of the patient. Each contributes to the other — cure helps to care; care is a part of cure. Yet the two words do have different derivatives and a different meaning. Cure is derived from the Latin *curare,* meaning to heal or to preserve. Care, on the other hand, comes from the Anglo-Saxon word *cearu,* meaning sorrow or, as a verb, to grieve. From this origin it is easy to see how the meaning progresses from sorrow to anxiety, to attention, to oversight, to responsibility, to solicitude, to affection, and so to the several meanings given to the word, care, in the present day.

Cure is a cold word, like so many of those derived from the Latin and Greek. Care possesses the warm qualities of the words coming down to us from Anglo-Saxon and Old English—from this source arise such pleasant words as love, friend, hearth, home and child. I am taking this little etymologic detour because I want you to appreciate the overtones of this word, care, for in them reside the seeds of all the matters which have been or can be discussed in the lectures of this series on the care of the patient. One lecturer may stress the importance of sympathy, which means to share suffering or sorrow—the original meaning of *cearu.* Another may stress the point, as Peabody did, that one cannot care for a patient unless one feels affection for him, and so on, through the gamut of the synonyms of the word with their slightly varied meanings. Now the shade of meaning which I want to emphasize is best expressed by the words, responsibility and attention, as they apply to the care of the patient.

Let me illustrate this matter by presenting to you certain facts about an actual patient just as one does in a clinical lecture; and, as we go along, I will point out a few of the innumerable opportunities for care which every patient presents.

Mrs. A., 40 years of age, is the mother of three healthy children, 7, 12 and 13 years of age. Her husband is healthy and is employed as a clerk at sixty dollars a week. The patient has always been healthy and has had but few minor ailments; her pregnancies were uncomplicated. For the past 3 months she has progressively become weak and dyspneic and has lost some weight. No other symptoms are elicited by thorough questioning. Physical examination reveals no abnormality but extreme pallor, evidences of loss of weight, a rapid pulse and hemic murmurs in the neck and heart. The blood count confirms our suspicion of extreme anemia; the hemoglobin is 30 per cent, the red blood cells number 1,600,000 per cubic millimeter and the white cell count is a little low. The urine is normal.

This much we have learned very promptly, and our diagnostic problem is clearly defined; severe anemia, type unidentified, is our preliminary diagnosis, and if the anemia should prove to be secondary, the cause is still unknown. Obviously at least one transfusion is indicated to tide the patient along while further diagnostic steps are being taken. Final decision on other therapy will have to wait on diagnosis. She is certainly an interesting case—but heaven help her and her family if that is all that we doctors see in her.

Already we have had many opportunities to commence the care of our patient, even though we have only taken the history and made a physical examination. That the method of taking a history should enter into the care of the patient may seem ridiculous, and yet it is true that kindliness as opposed to harshness, sympathy as opposed to indifference, can be exhibited in the mere wording of questions and in the approach to certain phases of the history. It is a small detail but an important one, and it influences not only the entente cordiale which you should cultivate between your patient and yourself but the ease of obtaining the history you want and the fullness and accuracy of the record. Once offend the patient's sensibilities, and, consciously or unconsciously, she will draw back into her shell and become a little reserved or even taciturn and stubborn.

Of course, you must get the information you need, but there is all the difference in the world in your choice of words, your tone and the manner of asking. Some topics and some patients need more tactful handling, but all should be treated with courtesy and consideration. Young doctors sometimes seem to think that a brusque, abrupt manner will stamp them as busy and important and will, accordingly, impress the patient; far more often it alienates and is only too easily recognized as the protective mannerism of an inferiority complex.

Much this same line of reasoning can be applied to the physical examination as to the history. Again, carelessness and lack of consideration will reap only a loss of confidence and will also make the task of the examination more difficult. The art of the care of the patient can be exhibited just as much in the physical examination as at any other time. Gentleness and thoughtfulness for the patient's modesty and comfort will expedite your examination as well as earn the gratitude of the sick individual. Take, for example, the apparently simple matter of abdominal palpation. Dr. Careless with cold hands and abrupt attack on the tender abdomen causes involuntary alarm and pain with resulting rectus spasm barring the way to any deeper palpation. Dr. Careful, on the other hand, gives the recti and the patient warning, the hand is warmed, the approach is gradual—"Who goes there?" "A friend"—and the recti

relax. As go the recti, so go the patient's feelings toward you.

I will mention just one more detail—trifling but of tremendous importance when added to all these other little details which make up the total which is the art of the care of the patient. During this discussion, Mrs. A. has had time to be admitted to a hospital for diagnosis, and if that hospital is ready also to play its part in the care of the patient, every single member of its personnel—doorman, clerk, nurse, intern and staff—will be cooperating to make poor, frightened Mrs. A. feel that she is in the hands of friends whom she can trust and who have her best interests at heart.

To you, I need not enumerate all the many diagnostic tests, the enormous amount of detailed study, which may be necessary to arrive at a positive diagnosis,—the further blood studies to exclude the primary types of anemia and the ever-widening investigation for the cause of the secondary types by laboratory and by roentgenologic study,—until poor Mrs. A., if she has not in the meantime succumbed to the hardships of our diagnostic study, is ready for treatment. And prompt treatment she needs, for her trouble has been found to be a bleeding carcinoma of the ascending colon. "A very interesting case!" I can hear you saying, "But does he think that we at Harvard do not know that cancer of the colon, especially on the right, may give an intense anemia without any localizing symptoms? And why report it in a Care of the Patient Lecture; it's all been straight diagnosis and treatment, and there's been no mention of anything more?"

The answer is easy. I chose this case to get you to think that way because that is just how all of us are apt to think, overlooking the fact that this woman also needs care and offers opportunity for care in every possible meaning of the phrase, the care of the patient. This is true whether this patient is in the hospital ward, in the office or in the home. Of course, in the hospital, some phases of her care may have been seen to by the nurses or by social-service workers, but often such details fall between the chief, intern, nurse and social worker, each assuming that the other has done the little thoughtful things which together make up the care of the patient.

Take the matter of Mrs. A.'s transfusions. She has needed two during the period of diagnostic study, and she will have to have at least two more to permit laparotomy. You know as well as I the detailed care in the selection of a donor; the typing and the cross agglutination tests; the choice as to method and amount. We know that she must have several transfusions before an operation can be considered safe; we know that a transfusion is simple, painless and safe; but what does Mrs. A. think about it? She may be suddenly placed on a stretcher and wheeled off into the unknown—it's only for a transfusion, but no one happens to tell her where she is going or that the transfusion is really nothing. Or an intern says, "Tomorrow you will get a transfusion," thinking he is giving good news; but the ignorant and apprehensive patient lies awake all night, worrying about whether it hurts, whether an anesthetic is used, what this strange blood will do to her, whether it costs anything, and so on through a thousand questions that a fearful mind can find to worry about. A transfusion is such a matter of routine to us that we forget its strangeness and possible unpleasantness to the patient. Today, it is true, the recipient is usually spared the sight of the donor; but, even so, the procedure may be quite disturbing. And now that we are using cadaver blood increasingly often, we must be very careful not to let out this alarming fact to the patient.

Expense is another important aspect of transfusion which enters into the care of the patient. Blood costs money, and few hospitals have sufficient funds to give free blood even to all the ward patients who need it. Private patients must, of course, pay. Mr. A. is a clerk on a fair salary, but he must engage someone to care for the children and the home. He is ready to spend every cent he has for his wife, and no one would think of not letting him pay for any necessary transfusion, if he can. He has a little money saved up for such emergencies. But remember that word "necessary." The responsibility rests squarely on the doctor not to allow a family to impoverish itself for transfusions for a hopeless case—for example, extensive carcinoma or bacterial endocarditis. The proper care of the patient includes the protection of the financial resources of the family. No one would buy a short, futile extension of life at the price of the money needed for the children's health and safety. Especially must we husband the family resources if it is the only wage earner who is fatally ill. At all times the doctor should know the financial status of his patient and try to adjust expenses to it, often sacrificing his own fee by persuading the patient to enter the hospital ward when this is the right place for him. I can well imagine a lecture in this series being wholly devoted to the topic, "The Care of the Patient: His Pride and His Purse."

This matter of expense is of vital importance to many patients. A little thought on the doctor's part can often save the patient much money or time, and, to the wage earner, time is money. Young doctors trained in big teaching hospitals are too apt to demand too many examinations to arrive at a conclusion which might have been reached less expensively if a little thought had been given to the tests selected or to the order in which they were done. For example,

in the case of Mrs. A., an inexpensive test of the feces for blood after a few days on a meat-free diet would have given us a short cut to the diagnosis of hemorrhage from the digestive tube as a cause of her anemia, and a knowledge of the probabilities would have led to a barium enema, thus avoiding perhaps a great variety of other expensive investigations.

Mrs. A. has a carcinoma of the colon, there is no evidence of metastasis, and our duty is clear. We must advise laparotomy and let the conditions found determine the procedure to be carried out by the surgeon. At once all sorts of opportunities for the display of skill in the care of the patient present themselves. Mrs. A. must be told enough of the truth to persuade her to undergo an operation, but not the whole truth, which is, for her, needless. What possible excuse is there for insisting that she be informed that her disease is cancer and that the operation may not be successful? She will be frightened enough by the thought of any disease requiring surgery, so let us paraphrase, let us speak of an ulcer, an obstruction, a bleeding point or something other than cancer, let us be truthful, if you wish, about the operation itself—but do we have to explain all about the distant dangers of metastasis? Let us bring Mrs. A. to the operating table in that state of mind best fitted to help her recovery. That seems to me to be the doctor's duty in the care of that patient. Of course, to the next of kin the whole pitiable truth must be told to insure the proper settlement of business and family matters, the proper understanding of the possible need of radiation therapy after convalescence, and so forth; all of this takes tact, time and patience, but all of this is part of the care of the patient.

By this time Mrs. A. has come to trust in you and to depend on your smile and strength. If so, take the time to be with your patient, even if only for a minute, on the way to the operating room. Let her feel that you are standing by. Of course, your scientific interest will make you want to see "the aseptic scalpel dispel the mystery and reveal the truth," as the great Deaver always said; but once you have seen, slip out and tell the family how things are going and what the outlook is. Remember it has seemed to them an unexpectedly long time since the patient went to the operating room. It always does take longer than expected; the stated time seldom allows for scrubbing up, anesthetization, bandaging and returning to the room, much less for unexpected delays. It is a worrisome time for the family, and they will long remember your thoughtfulness if you add this item to the many others which constitute the care of the patient.

It is not easy to be the bearer of bad news, but it had to be done in this instance. At operation, the annular carcinoma of the colon was easily found and could have been excised, but there were many secondary metastatic nodules in the liver so there was no use in removing the primary growth. Here is another situation offering untold opportunities for the exhibition of every type of care, kindness and helpfulness to the family, cheerfulness and optimism to the patient, and careful medical attention to her every symptom. There is a tragic tendency to become careless in therapy when one knows that the disease is incurable. Let me again refer you to the excellent lecture of this series by Alfred Worcester on "The Care of the Dying."

And now in closing, let me repeat that as I see the care of the patient it is just a part of the job of being the patient's doctor. Nothing that has been or can be said about the care of the patient is anything but a part of the doctor's simple and obvious duty to every patient, whether in the ward, the tenement or the castle of the economic royalist—in fact, the rich sometimes get less real care than the hospital ward patient. Perhaps I should admit that the care of the patient, as I visualize it, becomes a sort of refinement of the job as it is usually done—a sort of work of supererogation, as it is called in the church. This is defined in the church as doing good acts not imposed under obligation. And yet this definition defeats my every purpose, for I will not admit that any degree of care can, in the very nature of things, be beyond what is imposed by the simple obligation of being that patient's doctor.

Some part of such care, and a very important part, is that stressed by previous lecturers to whom I have referred; another part perhaps resolves itself into the refinements of medical investigation and treatment; but is it not true that benefit comes to the patient from attention to the innumerable trifles which in the sum total interfere with the success of the treatment directed at his disease? Of course, the digitalis comes first, but such simple things as chewing gum for a tickling throat, a protective ointment about an irritated aperture, the care of the chafed elbows of the restless patient, are refinements, but they are part of our obligation too. It is far better for the patient to be permitted to sleep by the removal of the variety of minor discomforts which in the sum total keep him awake than it is for him to receive nightly such a dose of sedatives as is necessary to render him oblivious to anything but a thunderclap. The intern who routinely orders a sedative for each of his patients may think he is caring for them, but he is often caring only for himself and his own slumbers. The intern awakens refreshed, but the poor patients have a sedative hang-over even if nothing worse. And we all know the tragic story of the habitual use of the modern, so-called "harmless" sedatives—running all the way from the fatal agran-

ulocytosis from amidopyrine to the severe nervous and mental symptoms of chronic barbiturate intoxication.

As we proceed with this analysis of such a view of the care of the patient, it must be more and more clear to you that for this type of care the crux of the matter is your knowledge of the whole field of medicine. One may be sympathetic with a patient and yet be wrong in the diagnosis; a surgeon may have a wonderful bedside manner, but his patients may far too often insist on moving from the bed to the mortuary table. On the other hand, one cannot be superlative in the care of the patient in the manner which I am trying to describe unless one knows his business. In fact, I feel sure that the more one knows of medicine, the better one can care for his patients in the supererogation sense of that word.

For example, a doctor is called to see a child with whooping cough. What does the care of that patient include? It includes the proper treatment of the disease, and equally, of course, the making friends with the child, the reporting of the case to the board of health and the proper avoidance of spread in the family. All this is obvious and sounds easy, but who in the family should be most carefully protected from acquiring the disease—the grandmother, the parents, the older brother or the baby sister? Perfect care of that simple case of whooping cough requires that the doctor know how serious and often fatal whooping cough is to the elderly, who are quick to catch the disease, even though they had it in their own childhood. Only too often the grandmother, just because she is old, is chosen to nurse the patient, when she of all persons should be kept safe from contagion.

Any number of other examples could be detailed to make my point, but I hope my thesis is clear. I do not want to belittle those aspects of the care of the patient which form the basis of the wonderful lectures of Peabody, Thayer and others who have addressed this body in other years. I do my best to exhibit these qualities in practice and to inculcate them in my students, but I have chosen to present another aspect of the subject to you today. As individuals we may be lacking in the ability to express sympathy, in that greatness of character which inspires confidence, or in that optimism which cheers, but there is not one of us who cannot do his best to perfect himself in his knowledge and practice of medicine and who cannot, if he will, apply himself to supply by attention to detail the maximum of care from this point of view.

We should bring to our job every ability we have—emotional as well as intellectual, psychologic as well as technical. One of us will excel in one, another in the other, but all should do each as well as his capabilities will permit. The care of the patient is an all-inclusive word: perfect care, a goal never reached—our duty, its closest achievement.

The master word to guide to this end has often been expressed in ever-changing words and with varying emphasis but never better than by Marcus Aurelius two thousand years ago when he wrote, "Love the little trade which thou has learned, and be content therewith." If you, gentlemen, love your little trade, then your patients will not be lacking in care.

NEW ENGLAND SURGICAL SOCIETY

UROLOGIC COMPLICATIONS OF CANCER OF THE RECTUM*

BY J. DELLINGER BARNEY, M.D.,† AND SYLVESTER B. KELLEY, M.D.†

THE urologic aspects of carcinoma of the rectum have been mentioned very briefly, if at all, in the literature that we have reviewed. In only one article, an analysis of 300 cases by Hayden and Shedden,‡ are urinary complications dealt with at any length. One is led to believe from this dearth of articles that these cases either present no points of interest to the urologist or that they are infrequent. Having seen a number of such patients with urologic complications, we feel that the situation deserves more attention than it has been given. To this end we have analyzed a series of 200 cases from the surgical services of the Massachusetts General Hospital. This study indicates that there are a variety of urologic conditions that are associated with cancer of the rectum, not only before but also after operation. After discussing the matter with our surgical colleagues, we find that there is no unanimity of opinion, not only as to the extent and frequency of these conditions, but also as to their relief and etiology. We are grateful for the courtesy and cooperation of the

*From the urological and surgical services of the Massachusetts General Hospital. Read at the annual meeting of the New England Surgical Society, Bridgeport, Connecticut, September 26, 1936.

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‡Hayden, E. P., and Shedden, W. M.: Carcinoma of rectum; study of 303 cases. Surg. Gynec. Obst. 51:783 (Dec.) 1930.

numerous surgeons with whom we have conferred and who have helped us greatly in the preparation of this communication.

Eighty patients, or 40 per cent, had no urologic symptoms whatever, either before or after operation.

In 75 patients, urinary symptoms, both subjective and objective and of various degrees of severity, were noted before operation. It is impossible to say with any degree of accuracy to what degree factors other than cancer of the rectum were responsible for the symptoms. The extent of the growth and its relation to the urinary organs did not seem to be a factor. We make this statement because in 24 patients with bladder and in 7 with prostatic involvement, which probably also meant vesicular involvement, urinary symptoms and urinary infection were absent in more than half. Certainly one might expect that such a complication would result in urologic symptoms more often than it does. It is probable that the bladder, prostate and seminal vesicles derive their relative freedom from disease from protective fascial layers and from a blood and lymphatic stream that carries cells away from, rather than to, these organs.

In 53 cases (37.7 per cent), because of the extent of the growth, the poor condition of the patient or some other factor not revealed in the records, only an exploratory laparotomy, a colostomy or a cecostomy was done. The urine was uninfected in considerably more than half of these cases, while urinary symptoms were absent in almost as many. The onset of symptoms may well be accounted for on two grounds: (a) the poor condition of the patient and (b) the combination of anesthesia, operation and confinement to bed. The presence of an inlying catheter may also have its influence. While we can make no statement that is based upon statistics, we call attention to the fact that many old, debilitated patients may develop retention, cystitis, pyelitis and other urologic complications after almost any operation.

The fact is that the bulk of these complications are found to occur as a result of the more extensive two-stage or combined operations, to which the vast majority of these patients are subjected. In view of the unavoidable trauma to nerves, fascial planes, muscles and urinary organs, it is perhaps strange that even more urologic lesions do not arise. Our conversations with our surgical colleagues have shown, as already indicated, that there is a considerable variety of opinion as to the frequency of these symptoms. The factors of judgment, manual dexterity and skill must certainly be given much consideration because the symptoms seem to vary so much with the individual surgeons who perform the same operation, generally speaking, on the same type of case. According to some of these men, neither damage to nor preservation of the presacral nerve influences the results, but this is a matter for further debate.

The urologic complications to which we are referring may be divided into two groups—those seen before and those seen after operation. The subjective or objective symptoms that occurred in 75 cases before operation consisted of pyuria, frequency, nocturia, urgency, dysuria, and difficulty in voiding, which amounted occasionally to complete retention. The majority of patients in whom this occurred were males. These symptoms may be probably ascribed, as already has been pointed out, to the presence of a malignant growth that is adjacent or adherent to the lower urinary apparatus, but, to a certain extent, they are related to coincidental pathology. As a matter of fact, the urine was clear and uninfected before operation in 162 patients, or 81 per cent of the series.

In 78 cases, the symptoms already enumerated, together with certain others, — notably, epididymitis, cystitis, incontinence, impotency, vesicointestinal fistula, vaginal fistula, stricture of the urethra and chills and fever,—appeared after operation. This does not, however, give a correct picture of the situation not only for the reason that the records unfortunately lack the desired data in many instances, but also because practically all patients were put on catheter drainage as a routine measure to relieve retention. The length of time during which drainage was carried out was given in 49 cases, the average having been 11 days.

Epididymitis occurred in 6 cases, an incidence that is certainly less than that which used to be found when prostatectomies were performed without routine vasectomies. This valuable prophylactic procedure was carried out in but 1 of the patients of this series. Those in whom epididymitis occurred were not remarkable because of advanced age,—the average was 51 plus years,—but a badly infected urine was found in 4 of them.

Impotency is believed to occur in the vast majority of cases, but we have no information as to its onset, extent or duration. Further investigation should be made of this factor.

Temporary incontinence occurred in a few patients, but disappeared completely in a short time in all of whom we have record.

Frequency, nocturia, urgency and dysuria appeared, for the most part, to hinge upon the severity and type of the bladder infection, although nerve damage and traumatism of the bladder and prostate were certainly factors in a few cases. Of 87 patients on whom we have follow-up notes, 58 state definitely that they now have no urinary symptoms whatever. It is interesting, however, to find that the urine of the vast majority of these patients was either "loaded" with pus or definitely infected at the time of their discharge from the hospital. It is

unfortunate that the follow-up notes do not include information as to the character of the urine subsequent to the patients' discharge, but it is perhaps only natural to let a sleeping dog lie. In fact, residual urine was sought and routinely recorded in but 5 patients.

No details were given as to the amount of discomfort produced by the single instances of stricture of the urethra, vaginal fistula and vesicointestinal fistula, which are recorded.

In 1 case, subsequent cystoscopy revealed an invasion of the bladder, and probably of the prostate, with carcinoma. If and when this occurs,—and it is amazing that it does not do so more often,—nothing beyond palliative treatment with radiation or fulguration is generally possible.

In 2 or 3 cases, hydrocele appeared after operation, but evidently nothing was done beyond the usual tapping. It is quite probable, although the records do not so state, that a subacute or chronic epididymitis was the etiologic factor in these cases.

Having presented a fairly accurate, but perhaps rough, picture of the urologic complications that occur with cancer of the rectum, we shall discuss the matter of their prevention and treatment. We have avoided mentioning statistics, partly because of the well-known fact that even the best records so often leave out the very items that one would like to have.

With this object in mind we have interviewed our surgical colleagues at some length in regard to their experience and procedure. On our West Surgical Service, there are said to be few or no urinary complications of cancer of the rectum. The patients are put on catheter drainage for from 12 to 14 days after operation, and we are told that all patients are able eventually to empty their bladders. After getting out of bed the patient is catheterized every 12 hours, until there is only about an ounce of residual urine. No urinary antiseptics are administered by mouth for fear of upsetting the digestion. The bladder is irrigated with normal saline solution every 4 hours, as it is felt that this is quite as efficient as some of the more potent antiseptic solutions. Frequency and dysuria are relieved by means of tincture of hyoscyamus and potassium citrate. The presacral nerve is not intentionally spared during the operation. There has been no case of epididymitis, nor has the hospital stay been prolonged by pyelitis.

On the East Surgical Service the care of the patient, from a urologic standpoint, is left to the individual surgeon. Drainage of the bladder is carried out for about a week, following which treatment the patient is catheterized, and the bladder is washed daily if the residual urine is found to exceed 6 ounces. No urinary antiseptics are given by mouth.

The Urological Department at the Massachusetts General Hospital is not consulted routinely either before or after operation, although now and then we are asked to see some particular patient. At Pondville Hospital, it is apparently a routine measure to have all these patients seen by the urologic consultants before operation, because of the many urologic complications. Otherwise, there is no regular plan as to prophylaxis or treatment.

In the experience of some surgeons, retention never follows a first-stage excision of the rectum, and it is their opinion that a neurologic factor is usually associated with the retention that follows posterior excision.

One or two of our surgeons feel that urinary complications can be greatly reduced if care is exercised to dissect the rectum not too close to the prostate and that the presacral nerve can and should be spared by not cleaning off the iliac vessels too closely.

Dr. Daniel F. Jones feels that there is no clinical evidence that damage to or cutting of the presacral nerve influences bladder paralysis and, by the same reasoning, that its preservation is unimportant. He believes that retention, varying in degree and duration, occurs in about 95 per cent of cases, although it is less marked in women, and that all eventually recover from it. He puts all cases on drainage as a routine measure. In only 1 case has he seen retention persist for as long as 3 years after operation. Jones believes that impotency occurs in about 100 per cent of the patients, but has no data as to its time of onset or duration. In his experience, which agrees with our findings, the bladder, prostate and vesicles are very seldom involved in the growth, but he has had occasion, in some cases, to resect portions of these organs. We agree with him that, generally speaking, recurrence in either bladder or prostate is a catastrophe about which little or nothing can be done except to treat the patient by purely palliative measures.

We have shown from this study that cancer of the rectum is accompanied by a number of urologic complications. Certain of these are found to be present even before operation. In practically all patients there is postoperative retention of urine that requires drainage of the bladder by an inlying catheter. Our study of this material indicates that urinary complications are due not so much to the extent of the growth or its relation to the bladder and prostate as to the operation itself, especially the two-stage or combined abdominoperineal operation.

In view of these findings, we believe that every case of cancer of the rectum should receive urologic care. This would enable preoperative and coincidental lesions of the urinary tract to be diagnosed and treated, and improvement in the patient's general condition should result. It is needless and almost impossible to

give in detail the exact course that the urologist should pursue in this direction, for the reason that the indications vary so widely. Generally speaking, however, each patient should have careful and repeated urinalyses, catheter specimens being desirable, especially in women; studies of renal function, as shown by blood chemistry and phthalein output; roentgenograms and, perhaps, an intravenous pyelogram. Intravenous glucose might be either desirable or, in the case of dehydrated individuals, definitely indicated. Preoperative cystometric studies of the bladder would be of great value, especially for comparison with postoperative observations.

After operation the patient should receive similar care and study. No patient should be discharged until every reasonable effort has been made to eliminate residual urine and to clear up, so far as possible, the marked pyuria with which so many patients now leave the hospital. We do not believe that the number of leukocytes per field nor the amount of residual urine can always be taken for a guide as to the frequency or duration of catheterization. It all comes down to a question of judgment, and, after all, an infected but silent kidney may be the factor in many cases. This can be improved by renal lavage. In this connection, we feel that urinary antiseptics by mouth are definitely indicated, especially after operation, and should be continued unless there is a very definite reason for their omission.

We strongly advocate a bilateral vasectomy at the time of operation, unless there is a very definite contraindication to its performance. In view of the fact that impotency is so often a sequel to surgery for cancer of the rectum, it cannot be said that this procedure is unjustifiable.

In addition to these measures, we feel that bladder function would be more speedily restored by the use of the so-called Fraenkel exercises, which consist of re-education of the bladder muscle, and which are so successful in the relief of the retention that occurs in cord bladders.

Although there are certain postoperative sequelae that cannot be influenced by urologic care, it is felt that the cooperation of the urologist in cases of cancer of the rectum would be exceedingly valuable.

SUMMARY

1. Urinary complications of cancer of the rectum occur in about 60 per cent of the cases, and are often incapacitating. They are frequently the reason for a long convalescence after operation and are occasionally the cause of death.
2. They are, however, absent in at least half of the patients with bladder and prostatic involvement.
3. They occur for the most part after the two-stage or the combined abdominoperineal operation. They vary considerably in the practice of different surgeons. It is, therefore, probable that much depends upon individual judgment, skill and dexterity.
4. It is probable that damage to the presacral nerve is not a factor in the production of urinary complications.
5. While preoperative symptoms occur in about 38 per cent of the cases, they are largely those of infection.
6. Postoperative symptoms occur in an even larger percentage and include not only those patients in whom they are present before operation but others in whom they may well be ascribed to the operation itself.
7. There is little or no consensus among surgeons as to the incidence, prophylaxis, etiology and treatment of urinary complications. Further studies of large series of cases are desirable.
8. Every case of cancer of the rectum should receive urologic examination and treatment as a routine measure.

DISCUSSION

DR. J. DELLINGER BARNEY, Boston: *Mr. Chairman and Gentlemen:* There are just a few words more that I wish to add.

As you can see from our study of these cases, there are in fact a good many urologic complications of cancer of the rectum, some of which are important and some of which are simply interesting. It is fair to say that so far as I know no hospital or postoperative death can be ascribed to urinary complications.

In view of our studies, I think that I should like simply to make a plea that the urologic staff be given the opportunity of seeing all of these cases as a routine measure, not only before operation, but particularly after operation.

I won't bother you with laying out any set program because that would vary so much with each individual case, but I believe the urologist can at least detect any coincidental urologic pathology, such as stone, renal infection or bladder tumor, before operation—an observation which might influence the result. I think possibly we can clean up the infection of the urine, which so often occurs to such an extent after the removal of the carcinoma of the rectum.

We feel that we cannot do any harm and hope very much we can do good; we were very much surprised, in view of all these findings, that the literature says nothing about such complications.

DR. WILLIAM G. TOWNSEND, Burlington, Vt.: I think it must be very obvious that there is nothing further to be said on this subject. I am under the impression, however, that the urologic complications in cancer of the rectum are no greater nor any different from the urologic complications following an operative procedure in any individual of that particular age.

Of course, as you all know, cancer of the rectum is found much more frequently in the male than in

the female. The conditions to which these elderly men are heirs—namely, enlarged prostate and residual urine—favor that type of postoperative complication.

There is one complication of cancer of the rectum that has only recently been brought to my attention. A man outside of New England operated upon a patient for cancer of the rectum. Within 8 hours the bladder was distended, and the patient could not void. Several physicians tried to catheterize the individual, but with no success. Cystotomy was resorted to, and in a few days the patient died. Autopsy revealed a ligature about the urethra.

DR. CLYDE L. DEMING, New Haven: *Mr. President:* I am very much interested in Dr. Barney and Dr. Kelley's paper, because, prior to the development of cancer clinics, the urologic service was rarely called to see a patient who had been operated upon for cancer of the rectum and who at that time complained of retention of urine.

We usually found considerable retention with a bad infection. I do not think we treated such cases very well. We washed them out and gave them antiseptics, but they continued to have urinary distress, urinary frequency and, worst of all, severe bladder infection.

With the development of the tumor clinic, we have been asked more frequently to view these cases of rectal cancer from a urologic standpoint. Some of them show prostatic hypertrophy. As surgeons, we must recognize the fact that cancer of the rectum does occur at about the same age at which prostatic hypertrophy occurs and that the two lesions may appear at the same time. We should not be surprised to find them coexistent.

We have examined several of these patients by cystoscope before their rectal operations, and some of them afterward. One patient, in particular, had a definite injury to the nerve supply of the bladder, which was characterized by atrophy of the trigone, relaxation of the internal vesical sphincter and a fusiform base, which was demonstrated by the cystographic outline. This patient had had a rather extensive carcinoma of the rectum removed, and I hold nothing against the surgeon for having attempted to remove, as well as he could, such an extensive growth.

We have been recently following 3 cases of postoperative rectal cancer in which there were retention of 300 to 400 cc. of urine, a little prostatic hypertrophy and some atrophy of the bladder. I did not have an opportunity to study these patients from a preoperative standpoint or during the operative phase with a retention catheter.

The suggestion of the speaker is very good, and, if there is a period of atonicity during the postoperative phase, I should heartily agree with the idea of retention of the catheter during that phase.

DR. RICHARD B. CATTELL, Boston: *Mr. Chairman:* As this subject has been presented chiefly from the standpoint of the urologist and urologic surgeon, I should like to make a few remarks from the standpoint of the general surgeon.

Up to a few years ago, in the radical resections for cancer of the rectum, we were concerned with the high incidence of peritonitis, shock and pulmonary complications. At the present time, it is fair to say that, in our own experience, the major complication with which we have to deal following radical resections of the rectum is urologic in nature. In the past we have not had preoperative urologic consultation in these cases. It is an excellent suggestion and will help in the management of the urinary complications.

At the present time, I think we can conservatively state, irrespective of the age of these patients,—and many of them are young,—that the incidence of urologic complications in our own series is as high as 75 per cent. We have been forced, because of this high incidence of complications, to have a urologic consultation postoperatively in most of our cases.

The surgeon is responsible for the occurrence of the urinary symptoms. In performing a radical operation for cancer of the rectum, the base of the bladder, prostate and membranous urethra, as well as the vesicles, are traumatized. With the drop of the bladder into the presacral space, which is created by removal of the rectum, urinary stasis frequently results and is followed by infection. The urologist, in examining the bladder, will describe the same appearance that is present in complete prolapse of the uterus, with a large shelf below the bladder neck. For this reason all of our patients have continuous bladder drainage.

In resecting a large proportion (73 per cent) of cancers of the rectum, as we have chosen to do, it is obviously necessary to carry out procedures that interfere with these organs. We have had two deaths that resulted from urinary complications. Three years ago we lost a patient 5 weeks after the second stage operation of a two-stage abdominoperineal resection. He was still in the hospital because, in spite of prolonged urinary drainage, he developed pyelitis after the second week and, later, multiple kidney abscesses.

Within 18 months we have had a second death due to cortical abscess of the kidney. In order to avoid this so far as possible we believe that with the first rise of temperature, beginning at the tenth to the fourteenth day after operation, the patient should be returned to the operating room and the urologic surgeon should do a cystoscopy and pelvic lavage, and that this should be repeated every 2 or 3 days until the temperature remains normal.

In certain of our male patients of advanced age it has been necessary to do a transurethral resection of the prostate in order to relieve them of the persisting urinary symptoms.

DR. DONALD MUNRO, Boston: I should like to tell you of some unpublished work relative to the presacral nerve and its influence on the activity of the bladder. In cooperation with Dr. Pemberton, I have been making cystometrograms on bladders before and after presacral neurectomy. The neurectomies have been done for dysmenorrhea, and the women were otherwise normal.

There have been about 10 such cases observed, and in no case has there been any alteration in function, either for better or worse, following the section of the presacral nerve. Therefore, so far as the preservation of the presacral nerve at operation for resection of the rectum in women is concerned, I think that what evidence there is, at least in my experience, goes to show that the surgeon need not fear to sacrifice that nerve if necessary.

I would suggest also that time might be saved, and an awareness of urologic complications might be reached a little earlier than is the case when one waits until the patient shows a picket-fence temperature, if early postoperative cystometrograms are made on these cases. I think they should show characteristic changes that can be recognized early and treated in such a way as to avoid later infection of the bladder.

DR. WILLIAM C. QUINBY, Boston: I wish to congratulate the writers of this paper on its timeliness. From the urologic point of view, it is very important that the general surgeon should recognize much more often than has been the case in the past the compli-

cations that follow extirpation of the rectum for cancer. These complications are primarily due to nerve injury, which causes urinary stasis and which is then followed by infection.

Of course the patient should always be investigated thoroughly before being subjected to so radical a procedure as extirpation of a cancer of the rectum. If an infection of the urinary tract is present before the operation, it should be controlled, if possible. However, my experience in this type of case is that infection of the bladder, at least for a certain length of time, is inevitable, and that before operation the patient should be put on a urinary antiseptic. The best one at present is mandelic acid. At the time that the rectum is removed, the bladder should be placed on constant drainage with daily or twice daily exhibition of antiseptics. If these precautions are not taken, it is not to be wondered at that one occasionally finds high fever due to cortical abscess of the kidney, such as has been spoken of by Dr. Cattell.

Inevitably, as a result of extirpation of the rectum, there will be some injury to the motor mechanism of the bladder. This is doubtless one of the prices to be paid by the patient for being rid of a malignant tumor. That element of the bladder involvement which is due to obstruction and infection can be largely obviated if the surgeon takes it into account at a sufficiently early period.

TREATMENT OF THE AMBULATORY DIABETIC PATIENT WITH PROTAMINE ZINC INSULIN*

BY JOSEPH ROSENTHAL, M.D.,† AND HELEN E. FINKELSTEIN, B.S.†

IT is the purpose of this paper to present a clinical study describing the methods developed and the results obtained with the use of protamine zinc insulin in the treatment of the ambulatory diabetic patient.

For several years it was the aim of many investigators to obtain a substance which, when added to insulin, would prolong the hypoglycemic action. Various experiments, which included suspensions or emulsions of insulin in oil[1] and the addition of vasoconstrictor substances to insulin,[2] proved unsatisfactory.

Hagedorn, Jensen, Krarup and Wodstrup[3] were the first to use a combination of protamine and insulin in the treatment of diabetes, and early in 1936 they published a report describing the special action of protamine insulinate and also the clinical results obtained with its use on 85 diabetic patients. They added to insulin a protamine from the sperm of the rainbow trout (*Salmo iridius*) thus producing a precipitate which, when adjusted to the hydrogenion concentration of the body, retarded the absorption of the insulin so that the hypoglycemic action lasted about twice as long as with regular insulin. They treated diabetic patients with regular insulin in the morning and with protamine insulin in the evening with satisfactory results, and found that the wide fluctuations in blood sugar levels were avoided and that the danger from hypoglycemic reactions was lessened. There were no untoward effects.

Shortly thereafter, Root, White, Marble and Stotz[4] corroborated the work of Hagedorn and his associates with a group of 15 patients. Kerr, Best, Campbell and Fletcher[5] also reported good results by giving both protamine insulin and regular insulin to patients before breakfast. Joslin, Root, Marble, White, Joslin and Lynch[6] employed both of the above methods and also used protamine insulin twice daily. All of these methods were found to be satisfactory.

The use of protamine insulin marked a great advance in the treatment of diabetes. However, the stability of the solution was undetermined, and the protamine and insulin had to be prepared in separate vials and mixed prior to use. Furthermore, its effect did not last for 24 hours and, therefore, it had to be given twice daily or supplemented with regular insulin.

Scott and Fisher,[7] working with animals at the University of Toronto, found that, when a small quantity of zinc was added to protamine insulin, the action was more prolonged than with protamine and insulin alone and lasted more than 24 hours. In the latter part of 1936, many clinics were experimenting with preparations of protamine, insulin and zinc. Rabinowitch, Foster, Fowler and Corcoran[8] reported that the use of protamine zinc insulin with diabetic patients was definitely more effective in prolonging the hypoglycemic action than protamine and insulin alone.

Following these reports, a study was undertaken with 70 patients in the diabetic clinic of the Boston Dispensary for the purpose of developing methods for the treatment of ambulatory patients with protamine zinc insulin.* This group represented a cross section of the 300 active patients attending the clinic, 50 per cent of whom were taking regular insulin. It included also a small number of new patients who had not been previously treated in this clinic. The greater number of patients in the group had come to feel secure in the use of regular insulin and were fearful of change. They had to be educated concerning the pur-

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*This term, used throughout the paper, designates protamine insulin containing zinc, approximately 0.2 mg. per 100 units. The protamine zinc insulin was contributed by Eli Lilly & Company.

pose, action and convenience of the new insulin and the necessity of adhering to the diets prescribed for them.

The diets to be followed with the use of protamine zinc insulin were essentially the same as those previously prescribed with regular insulin. The carbohydrate content ranged from 100 to 250 grams with the normal amount of protein and with the fat decreased from the normal amount to meet the caloric needs.

As a result of the prolonged effect of the protamine zinc insulin, the carbohydrate content of the diet was rearranged to lessen the peak load at any one time. This was done by planning feedings between meals and before bedtime as required; and, further, the carbohydrate intake was distributed over as long a period of time as possible, by spacing the meals farther apart.[9]

The method of control was accomplished by fractional urinalyses made by the patients in their homes four times daily, with infrequent instead of repeated blood sugar determinations. The testing of the urine with Benedict's solution, to detect the presence of sugar, places a certain responsibility on the patient. Each patient is given charts on which are indicated the times when the tests are to be made and which provide spaces for the patient to record, with colored crayons, as nearly as possible, the colors of the test.[10]

The Benedict qualitative test is one of the simplest and most authoritative tests for determining sugar in the urine and is sufficiently delicate to detect quantities as small as 0.08 to 0.1 per cent sugar. The resulting colors, when this test is performed, denote the approximate amount of sugar present in the urine, as follows: blue — sugar-free; green — a trace of sugar; yellow—about 1 per cent sugar; orange —about 2 per cent sugar; and red—over 2 per cent sugar.

The patient brings to the clinic his record of the tests made in the interim between visits. The colors readily visualize the approximate sugar content of the urine during this period and serve as a guide for treatment.

The patient also brings a 24 hour specimen of urine, having been instructed to measure the total volume collected at home. The information obtained serves to estimate the amount of sugar excreted in the 24 hour period.

The first group treated with protamine zinc insulin numbered 15 patients, all of them severe or moderately severe diabetics who were taking two, three or four injections of regular insulin daily. The patients' ages ranged from 25 to 65 years, and all had been known to the clinic for 6 months or longer. Only 3 of them were not well controlled on regular insulin; these had had severe hypoglycemic reactions and marked glycosuria on the same day, due to changes in diet or in working hours, to variation in the amount of activity or to other environmental factors.

Changes in the dosage of insulin were made at intervals of from 4 to 7 days to protect the patients, in accordance with the statement made by Dr. Elliott P. Joslin and his co-workers[6] of the George F. Baker Clinic: "Because of the days required to adjust the diabetic to the new insulin and the possibility of reactions at the end of a few days, we believe the general distribution of the protamine insulin should proceed slowly. There is a latent period of from 2 to 5 or 6 days during which time there is apparently little effect from the protamine insulin. During this time one is tempted to increase the dose to a dangerously high point . . . . If this is done, then there is a sudden change on the fourth or fifth day after the beginning of treatment and a fall of blood sugar which is so rapid or may be so great that serious and persistent hypoglycemia may result."

We have adhered to the policy of changing the insulin dosage at intervals of from 4 to 7 days throughout the period of regulation, for it is our opinion that the maximum effect of all changes in dosage of protamine zinc insulin is not evident for at least 3 or 4 days. The patient is instructed to reduce the insulin by 4 units in the event of a hypoglycemic reaction, unless the reaction can be directly attributed to a deviation from the normal regime, such as excessive exercise or the elimination of one or more meals.

The patients in the first group were all given both regular insulin and protamine zinc insulin not more than 30 minutes before breakfast. Those patients who worked on night shifts took their insulin in the evening or early morning before the meal that was comparable to breakfast. Patients were instructed to inject, first, regular insulin into one leg and, then, protamine zinc insulin into the other. The dosage of regular insulin prescribed was slightly less in amount than that which the patient had formerly taken before breakfast, while the dosage of the new was slightly less than the amount of insulin he had been taking during the remainder of the day. This was considered a safe level at which to begin treatment, in order to avoid hypoglycemic reactions. If a patient had been taking a total of 60 units of insulin for the day,—that is, 20 units before breakfast, dinner and supper,—he was advised to take, before breakfast, approximately 16 units of regular insulin and 32 units of protamine zinc insulin.

With this treatment there was usually a glycosuria for the first 4 or 5 days, after which time the sugar excreted gradually became less. The chart on which the patient recorded the color reactions of urine tests was an important index for the increase or decrease of the pro-

CHART 1.

Case I	Insulin *	Urine Tests **			
Date 1936	Change in Dosage	Night time to before breakfast	After breakfast to before noon meal	After noon meal to before night meal	After night meal to bedtime
7-31	20-10-12-0				
8-1	(20)+12-0-0-0	+	+	+	+
8-2		+	+	⊕	+
8-3		++	+	+	++
8-4	(24)+14-0-0-0	⊕	⊕	++	+
8-5		⊕	⊕	O	⊕
8-6		O	O	O	++
8-7		++	++	⊕	+
8-8		O	O	O	+
8-9		⊕	⊕	⊕	⊕
8-10		⊕	⊕	⊕	⊕
9-4	(26)+14-0-0-0	⊕	⊕	⊕	⊕
9-5		⊕	⊕	⊕	⊕
9-6		⊕	O	⊕	⊕
9-7		⊕	⊕	O	⊕
9-8		⊕	⊕	⊕	+
9-9		⊕	⊖	⊖	⊕
9-10		⊕	⊕	⊕	+
9-11		⊕	⊕	⊕	⊕
9-12		⊕	⊕	⊕	+
10-23	(28)+14-0-0-0	⊕	⊕	⊕	⊕
10-24		⊕	⊕	⊕	⊕
10-25		⊕	⊕	+	+
10-26		⊕	+	+	⊕
10-27		⊕	⊕	⊕	⊕
10-28		⊕	⊕	⊕	⊕
10-29		⊕	⊕	⊕	⊕
10-30		⊕	⊕	⊕	⊕
10-31		⊕	⊕	O	⊕
11-1		⊕	O	⊕	⊕
11-2		⊕	O	⊕	⊕
11-3		⊕	⊕	⊕	⊕
11-6	(30)+14-0-0-0	⊕	⊕	⊕	⊕
11-7		⊕	⊕	⊕	⊕
11-8		⊕	O	O	⊕
11-9		O	⊕	⊕	⊕
11-10		⊕	⊕	⊕	⊕
11-11		O	O	O	O
11-12		O	⊕	O	⊕
11-13		O	O	⊕	⊕
11-20	(32)-0-0-0	⊕	+	⊕	⊕
11-21		⊕	+	⊕	⊕
11-22		⊕	+	+	⊕
11-23		⊕	+	⊕	⊕
11-24		⊕	⊕	+	⊕
11-25	(36)-0-0-0	⊕	+	⊕	⊕
11-26		⊕	⊕	⊕	⊕
11-27		⊕	⊕	⊕	⊕
11-28		⊕	⊕	⊕	⊕
12-1		⊕	+	⊕	⊕
12-2		⊕	⊕	⊕	⊕
12-3		⊕	⊕	⊕	⊕
12-4		⊕	⊕	⊕	⊕
12-9	(38)-0-0-0	⊕	⊕	⊕	⊕
12-10		⊕	O	⊕	O
12-11		⊕	O	⊕	⊕
12-13		O	⊕	O	⊕
12-14		⊖	⊕	⊕	⊕
12-15	(40)-0-0-0	⊕	⊕	O	O
12-16		O	O	⊕	O
12-17		O	⊕	O	O
12-18		O	O	⊕	O
12-19		O	O	⊕	O
12-20		O	O	O	O
12-21		O	⊕	O	O
12-22		O	O	O	O

*Protamine zinc insulin = circle around dose.
**Colors of urine tests = blue O, green ⊗, yellow +, orange ++.

D. A. (No. 299399). Required 42 units of regular insulin in three doses for 6 years. The chart describes the treatment in the clinic for 4½ months with protamine zinc insulin, and the changes in urine sugar. Present treatment with one dose of 40 units of protamine zinc insulin only.

tamine zinc or regular insulin or of both. If the patient showed a glycosuria in the forenoon, it was necessary to increase the amount of regular insulin; if glycosuria occurred in the afternoon, at night or in the early morning, it was necessary to increase the dosage of protamine zinc insulin. After the patients were well controlled, they began to experience mild hypoglycemic reactions in the forenoon. These were eliminated by decreasing the amount of regular insulin.

Following the satisfactory treatment with both old and new insulin, these patients were placed on protamine zinc insulin only. Two methods were employed in eliminating the regular insulin. With some of the group, the amount of regular insulin was gradually diminished, and the protamine zinc insulin was gradually increased, while with the remainder, the regular insulin was eliminated at once, and the protamine zinc insulin was gradually increased.

Glycosuria seldom occurred when the regular insulin was gradually eliminated, and the patients experienced no insulin reactions. The immediate elimination of regular insulin resulted in a glycosuria, and in most instances the urine did not become sugar-free for 1 or 2 weeks. A few of the latter patients continued to show glycosuria except at night, at which time the urine became sugar-free and mild insulin reactions occurred. As an increase in the amount

CHART 2.

Case 1	Insulin *	Urine Tests**			
Date 1936	Change in Dosage	Night time to before breakfast	After breakfast to before noon meal	After noon meal to before night meal	After night meal to bedtime
11-21	(22)+8-0-0-0	○	○	○	○
11-22		○	○	○	○
11-23		○	○	○	○
11-24	(26)0-0-0	○	⊕	⊕	⊕
11-25		⊕	⊕	+	+
11-26		⊕	⊕	+	+
11-27		○	+	+	+
11-28		+	++	++	++
11-29		++	++	++	++
11-30	(26)+6-0-0-0	++	++	++	++
12-1		⊕	⊕	+	+
12-2		⊕	⊕	+	+
12-3		⊕	⊕	⊕	+
12-4		⊕	⊕	⊕	⊕
12-5		⊕	⊕	⊕	⊕
12-6		⊕	⊕	⊕	⊕
12-7	(28)+4-0-0-0	⊕	⊕	⊕	⊕
12-8		⊕	+	+	+
12-9		⊕	+	+	+
12-10		⊕	+	+	+
12-11		⊕	+	+	+

Case 2	Insulin	Urine Tests
Date 1936-37	Change in Dosage	Night time to before breakfast
12-12		⊕ + + +
12-13		⊕ + + +
12-14		⊕ + + ⊕
12-15	(32)-0-0-0	⊕ ⊕ ⊕ ⊕
12-16		⊕ ⊕ ⊕ ⊕
12-17		○ ⊕ ⊕ ○
12-18		○ ⊕ ○ ⊕
12-19		⊕ ○ ⊕ ⊕
12-20		⊕ ○ ⊕ ⊕
12-21		○ ⊕ ○ ⊕
12-22		⊕ ⊕ ⊕ ⊕
12-23		○ ⊕ ○ ⊕
12-24		⊕ ⊕ ⊕ ⊕
12-25		⊕ ○ ⊕ ⊕
12-26		○ ⊕ ○ ⊕
12-27		⊕ ⊕ ○ ○
12-28		⊕ ○ ⊕ ⊕
12-29		⊕ ○ ○ ⊕
12-30		⊕ ⊕ ○ ○
12-31		⊕ ⊕ ○ ○
1-1		○ ○ ⊕ ○

*Protamine zinc insulin = circle around dose.
**Colors of urine tests = blue O, green ⊗, yellow +, orange ++.

A. K. (No. 277614). Required with previous treatment 42 units of regular insulin. The first date on this chart indicates the period after 4 months of treatment with regular and protamine zinc insulin when the patient was controlled on 22 units of new insulin and 8 units of regular insulin. The chart shows the shifts from protamine zinc and regular insulin to protamine zinc insulin only. Present treatment with one dose of 32 units of protamine zinc insulin.

CHART 3.

Case 3	Insulin*	Urine Tests**			
Date 1936	Change in Dosage	Night time to before breakfast	After breakfast to before noon meal	After noon meal to before night meal	After night meal to bedtime
12-3	10-0-8-0				
12-4	(12)-0-0-0	⊕	⊕	⊕	⊕
12-5		⊕	⊕	⊕	⊕
12-6		⊕	⊕	⊕	⊕
12-7		⊕	⊕	⊕	⊕
12-8		⊕	⊕	⊕	⊕
12-9		⊕	⊕	⊕	⊕
12-10		⊕	⊕	⊕	⊕
12-11		⊕	⊕	⊕	⊕
12-12		⊕	⊕	⊕	⊕
12-13		⊕	⊕	⊕	⊕
12-14		⊕	⊕	⊕	⊕
12-15	(14)-0-0-0	○	⊕	⊕	○
12-16		⊕	⊕	○	⊕
12-17		⊕	⊕	○	⊕
12-18		○	⊕	○	⊕
12-19		○	○	⊕	○
12-20		○	○	⊕	○
12-21		○	⊕	○	○
12-22		○	○	○	○

*Protamine zinc insulin = circle around dose.
**Colors of urine tests = blue O, green ⊗, yellow +, orange ++.

F. S. (No. 361419). Required 18 units of regular insulin in two doses for 6 months. The chart describes the treatment in the clinic for 19 days with protamine zinc insulin only, and the changes in urine sugar. Present treatment with one dose of 14 units.

of protamine zinc insulin with these patients would obviously result in more severe reactions at night or in the early morning, there was a return to the dosage of both regular and protamine zinc insulin before breakfast, and then a gradual reduction of regular insulin. With some patients, a rearrangement of the amount of carbohydrate in the diet, without any change in the amount or kind of insulin, was effective in rendering the urine sugar-free and in avoiding the occurrence of hypoglycemic reactions at certain times of the day.

With both methods the end result was the same. However, with the second method—the immediate elimination of regular insulin—the period of regulation was usually longer, and at times the transient glycosuria was alarming to the patients.

Case 1 (chart 1). This chart illustrates the control of the patient with changes in the amounts of old and new insulin, and later the shift to protamine zinc insulin only, with the immediate elimination of regular insulin.

D. A., a housewife, 27 years of age, had had one child by normal delivery. She had been treated continuously in this clinic since the onset of her diabetes 7 years ago, except for a period of hospitalization previous to her delivery. The patient was well controlled on a diet of 140 gm. of carbohydrate, 70 gm. of protein and 65 gm. of fat, a total of 1,425 calories. She was taking a total of 42 units of regular insulin—20 units before breakfast, 10 units before dinner and 12 units before supper.

On August 1, 1936, she was given 12 units of reg-

ular insulin and 20 units of protamine zinc insulin before breakfast. On this treatment she showed large amounts of sugar in the urine throughout the day for the following 4 days. On August 4, the insulin was increased to 14 units of regular insulin and 24 units of protamine zinc insulin. On this regime the colors of the urine tests were still orange or yellow before bedtime, but there was no sugar present at any other time of the day. On September 4, the protamine zinc insulin was increased to 26 units. The urine tests were green throughout the day, with occasional yellow tests before bedtime. This condition continued until October 23, when the protamine zinc insulin was increased to 28 units, the amount of regular insulin still being kept at 14 units. This dosage was continued until November 6, at which time the protamine zinc insulin was increased to 30 units before breakfast, with the amount of regular insulin as before. On November 20, the patient was well controlled, and the urine showed no sugar throughout the day. The regular insulin was then omitted, and 32 units of protamine zinc insulin were given once a day before breakfast. With this dose, the patient's tests for sugar were yellow and green. After 5 days, on November 25, the amount of protamine zinc insulin was increased to 36 units, after which time the tests were mostly green and occasionally yellow. On December 9, the protamine zinc insulin was increased to 38 units, and the tests were all green. On December 13, the protamine zinc insulin was again increased to 40 units, and since then the tests have been blue and blue-green throughout the day. The patient has had no reactions and is continuing successfully on one dose of protamine zinc insulin.

Case 2 (chart 2). This chart illustrates the immediate elimination of regular insulin with a resulting marked glycosuria, and the addition of regular insulin again with its gradual elimination for the ultimate shift to protamine zinc insulin only.

A. K., a male, unemployed, 55 years of age, had been a diabetic for 20 years. He had been well supervised under private treatment, but when admitted to the clinic, May 10, 1934, he was not well controlled because of financial difficulties. On June 25, 1934, the patient was well controlled in this clinic on 42 units of regular insulin—14 units before breakfast, dinner and supper. His diet was 170 gm. of carbohydrate, 73 gm. of protein and 74 gm. of fat, a total of 1,638 calories. After 2 years, on July 13, 1936, he was given 14 units of regular insulin and 20 units of protamine zinc insulin before breakfast, and with manipulation of the dosages of the insulin, by November 24 he was well controlled on 8 units of regular insulin and 22 units of protamine zinc insulin. At this time, the regular insulin was omitted, and 26 units of protamine zinc insulin were given before breakfast. The following day his urine tests were yellow before supper and before bedtime. On the next day his urine tests were yellow before dinner, before supper and before bedtime, and after 4 days the tests were orange throughout the 24 hours.

On November 30, the seventh day, the dosage was returned to 6 units of regular insulin and 26 units of protamine zinc insulin. In 1 week his urine tests gradually became green and blue throughout the 24 hour period. On December 7, the amount of regular insulin was decreased to 4 units, with 28 units of protamine zinc insulin. The urine tests were green in the morning and yellow the rest of the day. This increase in sugar was doubtless due to various environmental factors. On December 15, he was given 32 units of protamine zinc insulin, and the regular insulin was omitted entirely. All the urine tests since then have been green and blue-green. The patient has been kept on this dosage because of his tendency to hypoglycemic reactions.

A few patients who were also taking three doses of insulin were given one dose of protamine zinc insulin only, before breakfast. To avoid the possibility of hypoglycemic reactions, the procedure followed was to prescribe protamine zinc insulin in an amount about 20 per cent less than the total amount of regular insulin that the patient had been taking previously, and this dosage was gradually increased, as required. Most of the patients in this group showed a marked glycosuria for a period of from 2 to 4 weeks, after which time the urine gradually became sugar-free. Other patients continued to be uncontrolled for 5 weeks or more, and in some patients, the symptoms of diabetes recurred. It was found that in most instances this procedure lengthened the period of control.

Another group of patients, which consisted of diabetics who were previously controlled on one to two daily doses of regular insulin, were given one dose of protamine zinc insulin before breakfast, the amount of which was slightly less than the total amount of regular insulin that the patient had been taking. For example, a patient who had formerly taken a total of 32 units of regular insulin—16 units before breakfast and 16 units before supper—was given about 28 units of protamine zinc insulin.

Some of these patients promptly had evidences of a glycosuria. The dosage of protamine zinc insulin was then gradually increased at intervals of from 4 to 7 days until the urine became sugar-free. None of the patients in this group experienced insulin reactions.

Case 3 (chart 3). This chart illustrates the shift from two doses of regular insulin to one dose of protamine zinc insulin only.

F. S., a male, 60 years of age, a nightworker, had had diabetes for 6 months, during which time he was treated in this clinic. Before treatment with protamine zinc insulin, he was controlled on a diet of 175 gm. of carbohydrate, 90 gm. of protein and 100 gm. of fat, a total of 1,960 calories. He was taking a total of 18 units of regular insulin daily—10 units before breakfast and 8 units before supper. On December 3, 1936, he was given 12 units of protamine zinc insulin, and the colors of the urine tests were green throughout the day. Two weeks later, the protamine zinc insulin was increased to 14 units. Since that time the patient has been practically sugar-free with no insulin reactions.

More recently, a few new patients who required immediate treatment with insulin were given one small dose of protamine zinc insulin before breakfast. The dose ranged from 10 to 20 units, depending upon the severity of the diabetes. The original dose of insulin was increased or decreased, at intervals of from 4 to 7 days, in the mild cases by small amounts of approximately 2 to 4 units each time, and in the severe cases by larger amounts of from 4 to 10 units.

The mild cases responded very readily to treatment, while the severe cases presented a more difficult problem and took much longer to control. A few patients who presented complications, such as acidosis or acute infections, on admission were given regular insulin for 1 or 2 days or longer until their complications had subsided. Then they were treated with protamine zinc insulin, as described above. The experience with these new cases does not permit a more comprehensive presentation of methods at this time. The following case is an example of the treatment of a new patient with protamine zinc insulin.

Case 4. F. C., male, 27 years of age, a shipper in a steel factory, came to the evening clinic, November 2, 1936, showing classical symptoms of diabetes. A fasting blood sugar was 168 mg. per 100 cc. of blood. The urine showed a complete reduction with Benedict's solution and a slight trace of diacetic acid and acetone.

The patient was immediately treated with 20 units of regular insulin and was given a diet of 121 gm. of carbohydrate, 62 gm. of protein and 69 gm. of fat, a total of 1,353 calories. For the next 2 days he was given regular insulin, in amounts based on the urine tests, until the urine became sugar-free. On the third day, the patient had two hypoglycemic reactions, and the insulin was omitted. The patient did not return until 3 days later, at which time he had marked glycosuria, and diacetic acid and acetone were present in the urine. On November 8, he was given only 10 units of protamine zinc insulin before breakfast, and immediately his urine tests became green and blue throughout the day. On November 15, his diet was increased to 150 gm. of carbohydrate, 75 gm. of protein and 70 gm. of fat, a total of 1,530 calories, and the protamine zinc insulin was decreased to 8 units before breakfast. On November 22, the protamine zinc insulin was again decreased to 6 units, and the tests for sugar were negative for the next 4 weeks. He had no insulin reactions. The protamine zinc insulin was then omitted, and the tests have been negative for sugar since that time.

DISCUSSION

Seventy ambulatory patients in the diabetic clinic of the Boston Dispensary have been treated with protamine zinc insulin during the past 7 months and are still continuing this treatment. These patients appreciate thoroughly the advantages of the new insulin. They realize its great convenience and that with it they need be less apprehensive of insulin reactions. Altogether they are much happier.

The patients were given the customary consideration with respect to the insulin dosage, the adaptation of the diet to the required food constituents and the influence of personality traits and of factors in family and community life.

They may be reviewed in four groups, according to the technic of the treatment:

A group of severe diabetics requiring two, three or four doses of insulin daily, was given both regular and protamine zinc insulin before breakfast, with satisfactory results. The regular insulin was then eliminated by either of two methods. With part of the group, the dosage of regular insulin was gradually lessened until entirely eliminated, and the amount of protamine zinc insulin was gradually increased. Glycosuria seldom occurred, and there were no insulin reactions. At the same time, with the remainder of the group, regular insulin was omitted without gradation, and the amount of protamine zinc insulin was increased. With this procedure a glycosuria resulted that lasted from 1 to 2 weeks. In a few cases where the results were not favorable, the patients were returned to their former dosage, took both regular and protamine zinc insulin, and gradually decreased the doses of regular insulin until only protamine zinc insulin was used.

Another group of patients, also taking three doses of regular insulin daily, was given a single dose of protamine zinc insulin before breakfast. This method delayed the control and has proved less satisfactory than the foregoing treatment.

Still another group of less severe diabetic patients who were taking one to two doses of regular insulin daily was given only protamine zinc insulin once a day with satisfactory results.

A group consisting of new patients who had not been treated previously was given protamine zinc insulin only, except in a few cases, where associated diabetic conditions were present, when regular insulin was given until such complications had subsided.

The study showed that a gradual change in the dosage of both regular and protamine zinc insulin at intervals of from 4 to 7 days was indicated as a safe procedure with successful results. With this treatment most of the patients were controlled with one injection of protamine zinc insulin daily, and there were few hypoglycemic reactions. The total number of units of protamine zinc insulin required to control the patients was slightly less, in most instances, than the total amount of regular insulin that was required formerly. A few patients required more.

If the ambulatory patient develops an acute infection accompanied by a marked glycosuria with or without the presence of diacetic acid and acetone in the urine, the protamine zinc insulin is entirely discarded and only regular insulin is used. When only a mild glycosuria accompanies the infection, the patient may be kept on protamine zinc insulin, which is increased by small amounts as indicated. Such patients must be seen daily.

We have observed no noteworthy general reactions following the use of protamine zinc insulin. However, there have been a few, mild, local reactions, and some patients have experienced an uncomfortable "burning sensation" lasting usually from 1 to 2 hours. Such reac-

tions have occurred commonly in patients who were taking large amounts of insulin.

The methods used in this study were conservative, since there was very little in the way of precedent to follow in using protamine zinc insulin for the treatment of the ambulatory patient without preliminary hospitalization. Our experience has led us to believe that the period of control may be shortened by larger initial doses of protamine zinc insulin than were used with the patients of this study. We are now treating a special group of patients with an amount of protamine zinc insulin almost equal to that of the daily regular insulin previously taken.

CONCLUSION

It has been shown that, with the cooperation of the patient and with careful supervision, protamine zinc insulin can be used successfully and safely with uncomplicated cases of diabetes in the outpatient department, without preliminary hospitalization of the patient.

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A STUDY OF THE EFFICIENCY OF CARBON MICROPHONE HEARING AIDS*

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THE aurist should be seriously interested in the problem of prescribing a suitable hearing aid for the patient who is hard of hearing. Whatever decision he makes is usually regarded as final both by the patient and the general practitioner, who assume that the advice of the consultant is based upon an intimate knowledge of the patient's qualitative and quantitative air and bone conduction hearing and upon the ability to evaluate the efficiency of various sound amplification devices. The otologist's opinion regarding the *hearing status* is usually highly accurate; this is not always true concerning *hearing aids*, especially those of the common, small, easily worn, carbon microphone type.

It is a commonly accepted principle[2] that the hearing curve must be depressed 40 decibels or more before any kind of instrument is recommended. If an electrical aid is decided upon, the patient should be advised as to whether an air or a bone conduction device, with or without vacuum tubes, should be utilized. If the patient is told that the aid should amplify particularly the intermediate, low, or high scale, the names of some of the more popular devices on the market may be suggested. These should be given a trial before a final purchase is made. The patient is allowed to make the final selection in accordance with his own conclusion as to the device from which the greatest benefit is received. The more cautious otologists warn their patients never to buy an instrument without having had it on trial for at least a month.

There appears to be a conspicuous lack of detailed information available for doctors when the following inquiry is made: "How many decibels higher is a patient's hearing curve when he is using a hearing aid than when he is not using one?" The difficulty in obtaining such special information led to the present study, in which an attempt has been made to determine the amplification curves of a variety of electrical carbon microphone hearing aids when in actual use, both by normal patients and those who were hard of hearing. This contrasts with the work of Hartig and Newhart,[1] who reported the performance characteristics of hearing aids on normal and artificial ears.

Despite its greater efficiency, no vacuum tube apparatus was utilized in this investigation, because the average patient wears only a carbon microphone aid. The rheostat was set at its maximum in every experiment, and fresh batteries were always employed, together with an amplifier.

In making these curves a tone from a loud speaker was presented to the better ear while the subject blocked the other. The threshold for this tone was then determined by decreasing the input to the loud speaker with an attenuation box. An air conduction carbon microphone hearing aid was then applied with its microphone in the same position as the patient's head in the previous reading, and the

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threshold was redetermined. The difference in the two readings of the attenuation box gave the gain of the aid in decibels for this particular patient. By using several subjects, a mean value could be obtained, which was approximately equal to the assistance of the aid.

The technic used in evaluating a bone conduction instrument was necessarily different. As there was no way of determining the bone conduction threshold with and without an aid, the method of a threshold shift could not be used. We chose a group of normal persons whose air conduction tested normally and found their binaural threshold on our instrument, using a loud speaker. This was in effect no more than finding a line on our graph corresponding to the zero line on a Western Electric audiogram chart. We then took a group of people whose bone conduction tested normally with a Western Electric 2A audiometer, and with a bone conduction instrument on their ears, found their threshold on our instrument, using a loud speaker. The microphone of the bone conduction aid was placed where the heads of our first group of people had been. The difference between the figures for the bone conduction test and the normal binaural air conduction represented the performance of the aid for persons with normal bone conduction or, we might say, the equivalent hearing loss of the aid. To find the performance of the aid for abnormal patients it is necessary only to add the patient's bone conduction loss or gain, as determined by a Western Electric audiometer, to the curve. Our base line was determined with a binaural air conduction test because monaural bone conduction is nearly equivalent to binaural hearing, as the bones of the cranium are set in motion by the oscillator and the drop through the head of the sound intensity amounts in this case to only about 10 decibels.

These methods were employed because they actually utilized both normal persons and those who were hard of hearing; they gave a measure of the value of the hearing aid under actual working conditions. As the characteristics of the instrument in free space are, as a rule, considerably different from those with the instrument on the ear, other methods would have meant the manufacture of an artificial ear.

There were, of course, many variables to be considered, and these may be classified under two headings: first, physical errors and, secondly, psychologic errors. Under the first heading comes reverberation in the chamber. This was partially eliminated by using a room completely padded with felt. In order further to eliminate this trouble, the measurements were carried out in a sound stage situated in one corner of the room. This sound stage consisted of a cubical framework, on the top, bottom and two sides of which were layers of sheeting separated from each other by about 1 inch of air. A bedspring supported by two iron pipes provided the necessary platform on which to work. In one corner of this sound stage was placed the loud speaker. Facing this and standing on the bedspring was a chair for the subject.

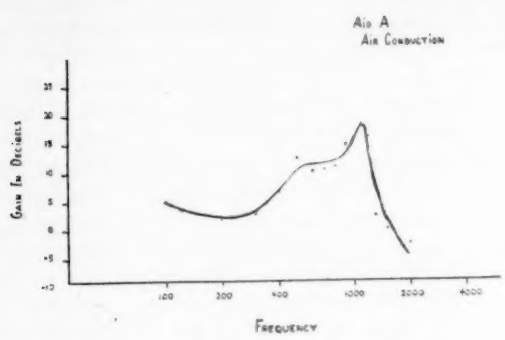
The next error under this heading is external noise. In spite of the fact that the room was situated in a subbasement and that it was thoroughly padded, noise somehow managed to be present. It was usually of an intermittent character and was present only at certain times of the day. The attenuator, beat frequency oscillator and switchboard were placed outside the room to eliminate noises caused by the operator. A further difficulty was caused by the fact that above 3000 cycles the room was slightly reverberant, and a standing wave pattern was formed in front of the loud speaker. This was especially bothersome when the hearing aid was placed on the patient's head, as standing waves were caused by reflections from the microphone. To eliminate these, it was necessary to work at high frequencies with the loud speaker turned sidewise.

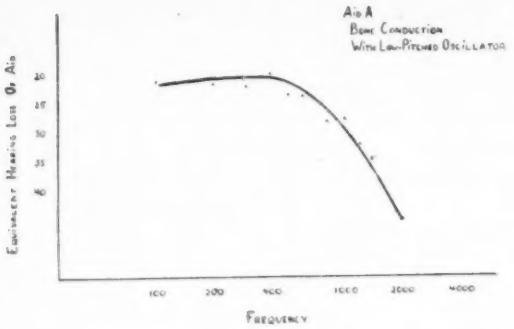
In addition, there were difficulties connected with the wearing of the instrument itself. If the ear piece adapter did not fit the external canal properly there was a difference of 5 to 10 decibels. Again, if the spring clips holding the bone conduction oscillator in place were not at the same tension, there was an error. Satisfactory adjustments were made.

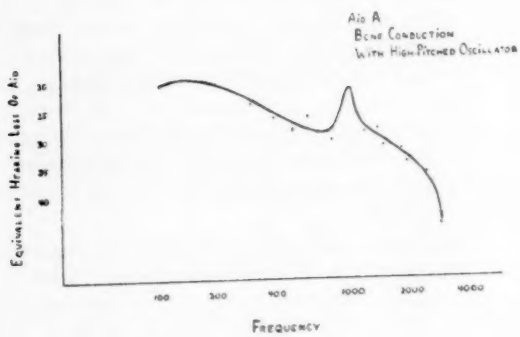
Under the psychologic difficulties are differences in keenness of attention, head noises, changes in acuity of hearing and fatigue. By taking each reading several times, the first three of these difficulties were eliminated. The fourth was more bothersome but was overcome by the use of rest periods. Sudden changes in volume were avoided. It was also found that interruptions changed the readings considerably.

Since two threshold measurements were made, another error, quite apart from those mentioned, is that due to the minimum perceptible loudness difference which a patient can detect. At the normal threshold this varies from 2 to about 4.9 decibels through the different frequencies used. If the same figures hold true for an abnormal threshold, the average error would be approximately plus or minus 4 decibels.* If minimum perceptible differences depend only on the intensity level of the sound at the ear and not on the apparent loudness as heard by the subject, then a chart could be made in which

*This is calculated as follows: The average of the normal threshold values for the minimum perceptible differences in the range investigated (64 to 8,192 double vibrations) is approximately 3.1 decibels. Two measurements to calculate the gain were taken. If the error in each case is represented by plus or minus the minimum perceptible difference, then the total error is represented by plus or minus the square root of the sum of the squares of the minimum perceptible difference. That is, the error equals plus or minus the square foot of $(3.1)^2$ plus $(3.1)^2$. This error was found to be plus or minus 4.3 decibels.


Aid A
Air Conduction
Gain In Decibels
Frequency


Aid A
Bone Conduction
With Low-Pitched Oscillator
Equivalent Hearing Loss Of Aid
Frequency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Bone Conduction
With High-Pitched Oscillator
Equivalent Hearing Loss Of Aid
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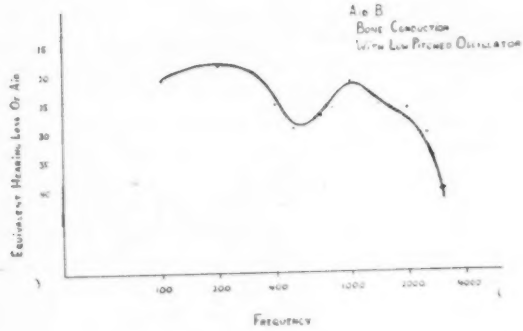
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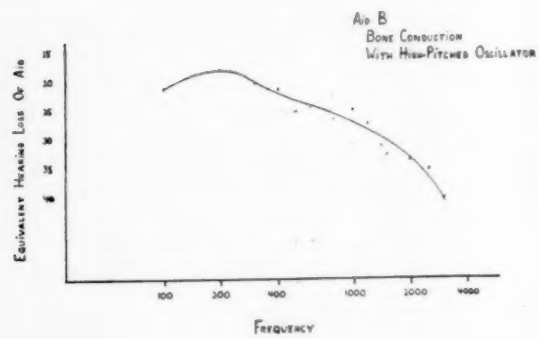
Bone Conduction
With Low-Pitched Oscillator
Equivalent Hearing Loss Of Aid
Frequency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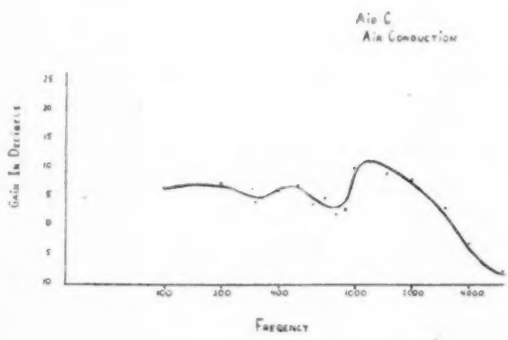
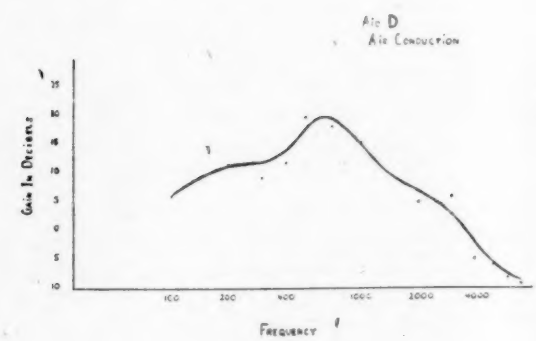
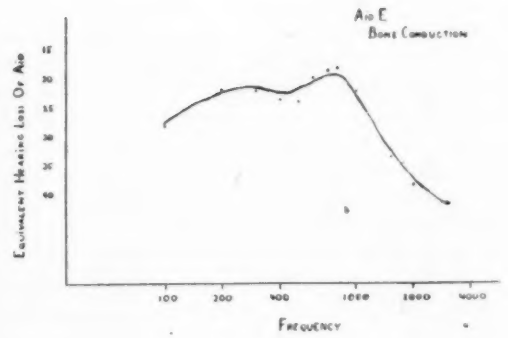
Bone Conduction
With High-Pitched Oscillator
Equivalent Hearing Loss Of Aid
Frequency


Aid C
Air Conduction
Gain In Decibels
Frequency


Aid D
Air Conduction
Gain In Decibels
Frequency


Aid E
Bone Conduction
Equivalent Hearing Loss Of Aid
Frequency

the minimum perceptible differences are plotted against intensity for the various frequencies. Such a chart would show the value of the minimum perceptible difference at any threshold.

Our hard of hearing subjects had a loss of hearing that amounted to from 20 to 40 decibels or more. With these threshold values, minimum perceptible loudness differences were from 0.5 to 2.0 decibels. Using the method of calculation described above, an error was obtained much closer to the actual one of 2.3 decibels.

The most remarkable fact about the accompanying air conduction curves is their relatively low degree of amplification. It is to be emphasized that the determinations represent each aid in actual use and not in free space. Fletcher[2] has mentioned hearing aid amplification curves of about 60 decibels, but the presumption is that such instruments were equipped with vacuum tubes in contrast to the small, wearable carbon microphone sets examined by us, none of which had vacuum tubes. The maximum amplification of an air conduction set was 20 decibels or less in our studies. If these same instruments had been studied in free space and not on patients, it is very likely that much higher efficiency curves would have been established. In this connection it should be made clear that the average patient is interested less in the efficiency of a hearing aid than in its size, convenience, appearance and ease of concealment. Since a vacuum tube apparatus is rather bulky, its popularity varies inversely with its size and weight.

The tones between 256 and 4,096 cycles are most important for speech perception. The middle of these five octaves, 1,024, is of very great importance. It is probably for this reason that the air conduction aids usually have a peak amplification at about this level. This may also explain why distortion of low-pitched sounds is prominent in some aids.

The absence of amplification of high-pitched sounds throughout the series of curves is striking. The relatively low cut-off level of some of the curves would make perception of high-pitched consonant sounds difficult, while low-pitched vowel sounds would be relatively well heard. This is a practical point, in that many users of hearing aids are experienced lip readers and find it easy to read consonant sounds on the lips, whereas vowels are much harder to pick up with certainty. Such patients frequently use an artificial aid to *hear* vowels and utilize lip reading to *see* consonants.

Many patients ask the aurist if treatment will improve the hearing sufficiently to dispense with an ordinary hearing aid. While the aurist may reasonably be expected to make a guarded prognosis, he may hope in some cases to obtain the very moderate improvement which follows the use of a hearing aid.

It is obvious from the curves that none of the aids included in the study would enable a patient with hearing at less than a meter to go to the theatre, a lecture or church and hear speech easily. It should be observed also that the amplification curves are not "linear" or "uniform", hence some of the sounds heard would be perceived as sound but not as intelligible speech.

The problem as to whether every hearing aid should produce linear amplification or selective amplification is of great interest. If selective amplification is produced by a hearing aid and happens to fit the defect in the hearing curve of a deaf person, so as to convert a sloping curve into a straight line, it seems probable that the user of such an aid would be enthusiastic about it. It is argued that persons with severe deafness become so accustomed to hearing distorted speech sounds that it is better for a hearing aid simply to elevate the patient's hearing curve in its entirety, making any re-education to a new set of conditions unnecessary. The efficiency of the ordinary speaking tube is an argument in favor of this hypothesis. Our experience in the examination of the various hearing aids studied is that none of them produce absolutely linear amplification and that the curve tends strongly toward distortion of speech sounds. The poor or absent amplification of high-pitched sounds is of especial importance. A bulky, vacuum tube apparatus was recently demonstrated to one of us as producing amplification through the 8,192 octave without "cut-off", but this aid was not included in the present study. Its manufacturer also claimed relatively linear amplification throughout, but found that he could use only vacuum tube apparatus.

An amusing paradox in the investigation was the presence of greater amplification for high tones with a low-pitched oscillator for bone conduction than could be produced with a high pitched oscillator in the case of aid, B. This finding suggests that considerable variation exists in the individual instruments commercially available. We do not mention this to challenge the fact that the peak of the amplification curve can be moved so that an instrument may be made to produce low-, medium- or high-pitched amplification. Our studies do indicate, however, that the actual shift is relatively slight and of little practical value.

The bone conduction curves have been made for several of the common hearing aids in an effort to establish a method for measuring relative hearing aid efficiency when a deaf patient uses a bone conduction apparatus. The technic used by us for such measurement has been described above. While numerous factors of error can be pointed out, such factors are concerned chiefly with the present methods of bone conduction audiometer measurements. It should

be kept in mind, however, that the lower and probably middle scale determinations are relatively accurate with a well-calibrated audiometer and bone conduction receiver.

SUMMARY AND CONCLUSIONS

1. Only portable carbon microphone hearing aids have been tested.
2. No effort has been made to prove or disprove any theories regarding portable carbon microphone electrical hearing aids. Impartiality toward the various instruments that were investigated has caused us to designate them by letters rather than by name.
3. Medical interest in any such instrument centers in the value of its action on the patient and not in what it accomplishes in the free space of a physics laboratory.
4. The air conduction curves reported show a maximum amplification value of only 20 decibels or less. When each curve as a whole and not merely its peak is considered, the amplification is considerably less.
5. The bone conduction curves represent the efficiency of the aid when applied to persons having normal bone conduction. Each such curve shows the equivalent hearing loss of such an aid in terms of normal binaural air conduction hearing perception.
6. Determinations of minimum, perceptible loudness differences in the present study indicate that deaf patients utilize what hearing they have more keenly than normal persons.
7. Further studies should be made to determine exactly the efficiency of the various commonly used commercial aids. Such information should be easily available to otologists.
8. The selection of a hearing aid should be a "service" and not a "sale" by the manufacturer.

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1. Hartig, H. E., and Newhart, H.: Performance characteristics of electrical hearing aids for the deaf. Arch. Otolaryng. **23**:617 (June) 1936.
2. Fletcher, H.: Can we scientifically advise patients as to the effectiveness of hearing aids? Ann. Otol., Rhin., & Laryng. **41**:727 (Sept.) 1932.

MILBANK MEMORIAL FUND

The Milbank Memorial Fund gave $321,518 in 1936 for projects and grants-in-aid in the fields of public health, medicine, population, education and social welfare, according to the annual report of the Fund, recently published. This brings to a total of $11,067,517 its appropriations for philanthropic purposes during the thirty-two years since its establishment in 1905 by Mrs. Elizabeth Milbank Anderson. Of this amount, approximately $3,500,000 was given in the period, 1930 to 1936.

In a foreword to the report, Albert G. Milbank, president of the Fund, points out that during this depression period "it has become evident that the conception of public health must not be restricted to its former limits, but must broaden out beyond the scope of preventive medicine to advance farther and farther into the field of social protection in the largest sense of the word. The successful application of corrective and preventive public health activities frequently rests upon the concurrent solution of many other problems,—for example, poor housing, nutrition, population trends and their influence on the future economic and social life of the country,—which formerly did not seem to have any close or intimate connection with public health. There is no single avenue of approach by which the goal of health and happiness for all of the people can be gained. Rather, its achievement will depend upon the concerted attack of the workers in many fields of social endeavor—medicine, public health, welfare and relief, education and research."

In 1936, the Fund assisted organizations in all these fields, although its principal contributions both in financial support and technical assistance were made in the field of public health. It continued its assistance to a public health experiment in a rural province of North China, carried on by the Chinese National Association of the Mass Education Movement, which has now been extended to seven other provinces. It cooperated with the League of Nations in the development of health indices which can be used internationally. It contributed to the advancement of the program of health center development in New York City. It assisted a number of organizations seeking the solution of specific public health problems, such as the control of venereal diseases, tuberculosis, and maternal and infant mortality. It gave financial assistance to training courses for public health nurses. Through its technical staff, it continued its studies in health administration, in the evaluation of specific public health procedures and in population.

The report also announces the appointment of Dr. Frank G. Boudreau as executive director of the Fund. Since 1925, Dr. Boudreau has been a member of the staff of the Health Section of the League of Nations, his latest post being that of chief of the League's Service of Epidemiological Intelligence and Public Health Statistics.

In addition to Mr. Milbank, members of the Fund's board of directors are: Cornelius N. Bliss, Dr. Livingston Farrand, Barklie Henry, Franklin B. Kirkbride, Samuel R. Milbank, Roland S. Morris and Frank L. Polk.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 23181

PRESENTATION OF CASE

A 62 year old Armenian laborer was admitted complaining of constipation and abdominal pain.

Two years before entry the patient first noted gradually progressive constipation, which became sufficiently pronounced at the end of 1 year to require frequent enemas and daily catharsis. His appetite remained unimpaired, but he had vague, generalized abdominal pain, occurring about 3 hours after meals. The pain lasted for several hours and was associated with the passage of considerable flatus. These symptoms continued relatively unchanged until 4 weeks prior to entry, when the pain became localized in the region of the umbilicus and assumed a sharp, stabbing, colicky nature. The attacks were relieved by the passage of flatus or feces. Three days before coming to the hospital, the pain became steady in character with frequent sharp exacerbations. The point of localization was unchanged. No note was recorded concerning the character of the stools, although it was stated that they were neither bloody nor tarry. There was loss of about 10 pounds in weight during the preceding year and considerable loss of strength. A prostatectomy for benign hypertrophy of the prostate had been performed 4 years previously.

Physical examination showed a well-developed but poorly nourished man in no acute discomfort. There was pallor of the skin and mucous membranes. The pharynx was injected, and oral hygiene was poor. A right dorsal scoliosis was present, but examination of the chest was otherwise negative. The heart was not enlarged, and there were no murmurs. The blood pressure was 155/85. The abdomen was soft, and no tenderness was elicited. Peristalsis was visibly active, but no masses were felt. Rectal examination was noncontributory.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red cell count of 4,050,000, with a hemoglobin of 60 per cent. The white cell count was 9,600, 63 per cent polymorphonuclears. One stool examination gave a negative and another a positive reaction to the guaiac test. The nonprotein nitrogen of the blood serum was 13 milligrams per cent. The serum protein was 5.5 grams per cent. A blood Hinton test was negative.

An x-ray film of the chest showed evidence of old rib fractures on the right side. The heart was normal and the aorta slightly elongated. There was slight dorsal scoliosis to the right. A Ghon tubercle was seen in the right middle lung field. A barium enema passed to a point in the left side of the transverse colon, where it met a definite obstruction and outlined a sharply rounded mass occupying the lumen of the bowel. As the pressure of the barium in the distal colon was increased, the mass suddenly gave way and moved along the transverse colon and around the hepatic flexure to the midascending colon. After evacuation the original condition was again observed; the mass lay in the left side of the transverse colon and the colon proximal to it was invaginated. The cecum and appendix were visualized at this time and appeared to be drawn upward but were not included in the invagination. The terminal ileum did not fill.

Four days later another barium enema met with obstruction in the transverse colon at the spine. There was an egg-shaped mass, about 4 by 6 centimeters, visible with pressure, within the proximal end of the filled segment. With the increasing pressure of the enema, a very small amount of barium passed beyond the mass, and the mass gradually migrated to the region of the hepatic flexure and finally into the upper portion of the ascending colon. This movement continued for about 15 minutes, and the completely filled portion of the colon followed the mass. When the latter had reached the ascending colon, more barium passed beyond it and filled the ascending colon, cecum and appendix. The cecum was normal in size, but the ascending colon was dilated. No filling of the small intestine was possible. After evacuation the mass fell back to the hepatic flexure but was pressed down into the ascending colon by the insufflation of air. Throughout the examination the mass was surrounded by normal but stretched mucosal folds, although the surface of the mass itself was smooth. The colon proximal to the mass was always dilated and, with the exception of the cecum, showed stretched mucosal folds. A thin, stalk-like trail followed the mass and was still visible while the tumor was in the ascending colon; the proximal end of the visible portion of this trail was at the ileocecal valve. There was a constant, small defect in the lateral wall of the ascending colon, just proximal to the mass. The ascending colon and cecum varied in length throughout the examination. They were shorter when the mass

was in the transverse colon than when it lay within the ascending colon. There was only a moderate amount of air in the small intestine, and the loops showed no evidence of dilatation.

On the twelfth hospital day a laparotomy was performed.

Differential Diagnosis

Dr. Beth Vincent: In this case we have the history of a 62 year old Armenian which is very suggestive of subacute intestinal obstruction—obstinate constipation dating back 2 years and a short period of acute attacks of abdominal pain, which were relieved by the passage of feces or gas. The pain was colicky in nature and was always referred to the umbilicus —the type of pain we have been accustomed to associate with lesions of the appendix or with pathology in the region of the appendix. This individual had undergone a prostatectomy for benign hypertrophy 4 years previously.

The physical examination is essentially negative, except for one important note which states that there was visible peristalsis, confirming the possibility of some form of intestinal obstruction.

The laboratory findings are also essentially negative, save that one of the stool examinations gave a positive reaction to the guaiac test, as if there were a lesion discharging a small amount of blood into the large bowel. We have to consider, therefore, the most probable causes of subacute intestinal obstruction in an individual of this age. Naturally, the first thing that comes to our minds is the possibility of an intestinal tumor, benign or malignant in character; next, a constricting band; then, the chronic form of intussusception; and, finally, a volvulus, which, however, usually causes obstruction that is much more acute in type. A malignant tumor is always a possibility at the age of 62, and also a benign tumor. A constricting band is frequently the cause of subacute obstruction, but, in such a case one would have the history and would see the scar of a previous abdominal operation, which is not present in this instance. Chronic intussusception, as we know, occurs in adults, while we see the acute type in infants. Before making a final diagnosis in a case like this, one would, of course, ask for studies of the intestinal tract by x-ray. Perhaps it would be well to analyze this very interesting report of the x-ray investigation before we have the benefit of an expert's interpretation.

"As the pressure of the barium in the distal colon was increased, the mass suddenly gave way and moved along the transverse colon and around the hepatic flexure to the midascending colon." That immediately suggests that there may be a benign adenoma, which is attached at some place in the ascending colon and which, by force of peristalsis, has been propelled to this point, since the notes say that the intestine was partially invaginated. Although there is no history of gallstones, one might imagine the presence of a large gallstone, but I do not recall having seen one with this remarkable movability. Fecal masses sometimes cause obstruction in old people, but they are usually impacted and, like gallstones, do not wander up and down the intestinal tract in this remarkable way. The picture is much more suggestive of an exceedingly mobile adenoma with partial invagination of the colon.

"After evacuation the original condition was again observed; the mass lay in the left side of the transverse colon, and the colon proximal to it was invaginated." That is a very definite bit of information and reaffirms the presence of some degree of intussusception.

"When the latter (the mass) had reached the ascending colon, more barium passed beyond it and filled the ascending colon, cecum and appendix." This suggests that, under pressure of the barium, there was a reduction of the invagination such as we sometimes accomplish by an enema in the acute intussusception of infants.

"Throughout the examination the mass was surrounded by normal but stretched mucosal folds, although the surface of the mass itself was smooth." I cannot explain this observation, as I am not an x-ray expert.

"A thin, stalk-like trail followed the mass and was still visible while the tumor was in the ascending colon; the proximal end of the visible portion of this trail was at the ileocecal valve." Apparently this observation might be interpreted as typical of a movable tumor that passed down the colon and pulled the wall of the intestine with it.

"There was a constant, small defect in the lateral wall of the ascending colon, just proximal to the mass." That suggests the presence of a small ulceration at this point.

May we see the x-ray pictures?

Dr. Richard Schatzki: When Dr. Lingley gave the barium enema he saw an almost complete obstruction in the midtransverse colon. There apparently was a tumor in the midtransverse colon. He thought, however, that he might get a little barium beyond the lesion in order to demonstrate its size and, while attempting that and increasing the pressure of the enema, there was a sudden sound like the uncorking of a champagne bottle, and in the next moment the obstructing, ovoid mass was in the ascending colon. Then the patient emptied the enema, and he could see that the mass did not go quite so far back into the transverse colon as before but was lying just over the spine. You can see that there is no gas in the cecum. Here you can see something like a trail of barium, which could correspond to the filling of the invaginated part of the bowel. Then an air insufflation of

the colon was done, and the mass returned to the ascending colon. In all, two enemas and one examination with a barium meal were done, more because of our interest in the case than from necessity. The diagnosis was made after the first examination.

This is a picture taken after the administration of the barium meal and shows filling of the small intestine and the transverse colon. The cecum and ascending colon are not visualized. The small intestine seems to go immediately into the transverse colon, and the transverse colon is markedly dilated, almost to the splenic flexure. In one of the pictures, which is not included here, one could see the egg-shaped mass lying at the end of the transverse colon near the splenic flexure. The transverse colon was not completely filled with barium. The barium was only in the periphery of the dilated transverse colon, as if it surrounded something in the axis of the whole transverse colon. You see again the thin trail lying in the center of the dilated transverse colon, at the end of which there is the mass. After 24 hours the transverse colon was normal, and the ascending colon had reappeared. The appendix had also appeared, and the mass was in the left upper part of the ascending colon. We were eager to see what the flat films would show. They showed no air or filling of the cecum or ascending colon. The transverse colon was definitely outlined by gas surrounding something which filled the whole length of the transverse colon. The mass there was on the left side of the spine. We had trouble in deciding where the mass originated. I can tell you what we said without affecting your conclusion. We were never able to move the mass beyond this point in the ascending colon, and this fact suggested that the ascending colon was the original site of the lesion. The defect on the lateral wall of the ascending colon favored this assumption. Against it was the point that there still seemed to be invaginated intestine below the mass when it was in the ascending colon. Therefore, the possibility of a pedunculated tumor extending from the region of the cecum or from the small intestine, which had invaginated through the ileocecal valve, had to be considered. I did not know exactly where to place the site of the original tumor and finally decided that it most probably came from the small intestine.

DR. VINCENT: You suggest that there may be an invagination of the terminal ileum into the colon; yet at one point in the report it says definitely that the appendix was not involved in the invagination.

DR. SCHATZKI: Yes, that is true.

DR. VINCENT: It is hard for me to visualize an invagination of the terminal ileum and cecum which does not carry the appendix with it. However, at this point, I think we may take it for granted that there was invagination of the large bowel, and the question is to determine the lesion that may have caused the invagination.

In this region the more common lesions are tuberculosis and carcinoma. Also, there is the possibility of benign adenoma. There was an ulceration, which might have been tuberculous, but I do not think it likely that a tuberculous cecum would cause this type of invagination. It seems more likely that we are dealing with a pedunculated adenoma with an attachment very close to the ileocecal valve or possibly an attachment within the ileum itself. It is recognized that one of the causes for chronic intussusception in the adult is a tumor, sessile or pedunculated, in the intestinal wall. Another possibility is the invagination of Meckel's diverticulum. It is a rather fantastic possibility, because I cannot imagine just how this diverticulum could turn inside out and present a picture of smooth mucosal folds. You will recall that there was an ulcer defect near the tumor, but it is unlikely that this is an ulcer such as we associate with a Meckel's diverticulum. My diagnosis is intermittent chronic intussusception due to the presence of a pedunculated tumor in the region of the cecum or ascending colon.

CLINICAL DIAGNOSES

Intussusception of a tumor in the region of the ileocecal valve.

Lipoma?

DR. BETH VINCENT'S DIAGNOSIS

Benign tumor (adenoma?) of the cecum with intussusception.

ANATOMIC DIAGNOSIS

Lipoma of the cecum.

PATHOLOGICAL DISCUSSION

DR. TRACY B. MALLORY: The x-ray examination has really done a much more complete job in explaining this case than the surgeon was able to do at the time of operation. At that time the intussusception was reduced, and he found a large tumor mass in the cecum. He resected the cecum and a small portion of the terminal ileum. We found that the tumor was a polypoid, pedunculated lesion, arising in the cecum about 8 centimeters above the ileocecal valve, and the mucosa over its surface was ulcerated. When the mucosa was stripped back one could see bright yellow fat. The tumor was a simple lipoma of the cecum.

CASE 23182

Presentation of Case

A 31 year old Italian ship painter was admitted complaining of pain in the left side of the chest.

Ten months before entry the patient became ill with what was said to be left lobar pneumonia. This was associated with cough and watery sputum and was followed by "pleurisy." A physician tapped his chest on three occasions, each time obtaining bloody fluid. It was noted at that time that the heart was displaced at the right, and the patient was able to feel the cardiac impulse just inside of his right nipple. The duration of this illness was 6 weeks, including the period of convalescence, and subsequently the patient remained relatively well, although he had moderate dyspnea on exertion for about 7 months and difficulty in swallowing food and fluid for about 5 months. Six days before admission he had a sharp twinge of burning pain in the left lower anterior portion of the chest. The pain lasted for 3 or 4 seconds, shifted slightly with change in position and recurred about four times throughout the day of onset. During the succeeding 4 days there was no further discomfort, but on the day before entry the pain recurred with greater severity and persisted until his entry to the hospital. The pain, according to the patient, "felt like something rubbing together" and was partially relieved by lying on the left side. Lying on the right side produced a dry, hacking cough. There was associated dyspnea, which was relieved by assuming an upright position.

Eleven and 13 years before admission the patient had had enlarged tender glands in the left side of his neck. Diagnoses of cervical tuberculous adenitis and healed apical tuberculosis were made on the last occasion. An x-ray taken at that time, however, showed no evidence of tuberculosis or other pulmonary disease. There was considerable distortion of the left border of the heart shadow by a large mass. The patient failed to return for further studies.

Physical examination showed a fairly well-developed, rather sick-looking man lying on his left side. The skin was warm and moist. The trachea was displaced to the right. There was a right dorsal and left lumbar scoliosis, producing a posterior bulge of the right side of the chest. Expansion was generally limited. The apical impulse of the heart was palpable in the fourth interspace in the right anterior axillary line. The sounds were of fair quality, and no murmurs were heard. The blood pressure was 120/80. The entire left chest and seven eighths of the right chest anteriorly were flat to percussion, and posteriorly the lateral half of the left chest was likewise flat. No respiratory sounds were audible in these regions, and tactile fremitus could not be elicited. In the remainder of the chest the breath sounds were very harsh, but no rales were heard. The percussion findings were not recorded. The abdomen was not distended but was held tense. The liver extended three fingerbreadths beneath the costal margin. The spleen was not felt. The remainder of the examination was negative, including a rectal examination.

The temperature was 99.5°F., the pulse 100. The respirations were 28.

Examination of the urine was negative. The blood showed a red cell count of 4,900,000, with a hemoglobin of 85 per cent. The white cell count was 13,800, 64 per cent polymorphonuclears. Examination of the stool was negative. An intradermal injection of tuberculin in a dilution of 1:20,000 was positive.

An x-ray film of the chest showed a large mass occupying the greater portion of the left chest and displacing the heart to the right side. The mass had a convex posterosuperior border and extended from the anterior chest wall backward, its posterior margin lying just behind the anterior margin of the vertebrae. The left border of the heart was obscured by the shadow of the tumor. The esophagus was displaced backward and to the right, apparently following the posterior outline of the mass. The stomach was displaced downward by a mass in the region of the anterior portion of the left diaphragm, which appeared to be continuous with the mass described in the chest. The lower margin of this mass showed slight evidence of lobulation. The left lateral margin of the thoracic tumor was obscured by marked thickening of the pleura and by what appeared to be a small amount of fluid, which extended up into the apical region. Within the medial portion of the mass there was an air-filled space lying posteriorly, which was probably the small space occupied by the lower portion of the left lung. Between this area and the stomach was another air-filled space of variable size which could not be explained. There was a calcified gland in the left fifth interspace, close to the spine. There were destruction of the anterolateral portion of the left sixth rib and less pronounced destruction of the fifth rib in the same region. A barium enema showed a low hepatic flexure but was otherwise negative.

Shortly after entry a thoracentesis was attempted in the fourth interspace in the anterior axillary line. Solid tissue resistance was met, and 5 cubic centimeters of pure blood was removed. The patient's symptoms gradually lessened, and the temperature fluctuated during the first week between 98° and 100°F. and then gradually reached a normal level. On the eight-

enth hospital day an exploratory thoracotomy was performed.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: You can see this dulness on the left side, which displaces the heart nearly to the right ribs. The esophagus is also markedly displaced. This shadow, which at first sight looks like a gas bubble in the stomach, is not a gas bubble, for there is the stomach; so we have an area of radiance that looks like air in either a compressed lung or a cavity. There is no fluid level, so we assume that the shadow is due to the compressed left lung in that area. The mass extends from the fourth to the twelfth rib and across the midline but seems rather smooth, so far as we can outline it, although the upper margin is the only one we can see. The splenic flexure is in about normal position, but the right half of the colon and the fundus of the stomach are displaced downward. The destruction of the left sixth rib looks more like pressure atrophy than actual bone destruction.

DR. FREDERICK T. LORD: The process is more anterior than posterior?

DR. HAMPTON: The center of the tumor is anterior to the midline.

DR. LORD: The important features about this mass are that it is very large, has a sharp margin and occupies the anterior rather than the posterior part of the chest. In the description it is said to be lobulated in the lower margins. You did not speak of that.

DR. HAMPTON: I do not know how we can be sure of that. The air-containing area at the base is probably the reason for making the statement. It seems, if that air bubble or portion of air is irregular, that the tumor may also be irregular.

DR. LORD: There is said to be a calcified gland. It might be calcification in the mass.

DR. HAMPTON: It looks more like a gland.

DR. LORD: One would like to know more about this earlier x-ray at the age of 20.

DR. TRACY B. MALLORY: It was not taken here.

DIFFERENTIAL DIAGNOSIS

DR. LORD: Further information from a lateral as well as an anteroposterior x-ray at that time would help to determine the original site of the mass, which was presumably in the anterior part of the chest.

In the second episode, 10 months ago, the watery sputum raises the question whether the disturbance was lobar pneumonia. Further information about the sputum at this time, such as the presence in it of blood, oily or fatty substance, hair, bits of membrane, scolices, hooklets or cysts, would be desirable. Was the expectoration of watery sputum followed by urticaria?

The physical signs are consistent with the presence within the chest of a solid mass or of encapsulated fluid. No mention is made of the Hinton or the echinococcus fixation test on the blood serum. The positive tuberculin test in a dilution of 1:20,000 indicates tuberculosis, but not its degree of activity or extent. Did the mass pulsate on fluoroscopy?

DR. HAMPTON: No, it did not.

DR. LORD: Dr. Hampton suggests that the disturbance in the rib was atrophy from pressure rather than disease of the bone. Bloody fluid obtained by thoracentesis on four occasions may be of significance, but it is desirable to examine such fluids more thoroughly. A low red count may indicate the presence of other than pure blood. Cells suggesting malignancy or hair might be found in the sediment.

The next problem is what the mass may be. He has an old tuberculous process in a gland. In view of the long duration we have to consider a tumor of some sort, and we may exclude malignancy, except the possibility that an originally benign tumor has become malignant. So I am inclined to exclude sarcoma, Hodgkin's disease and carcinoma.

Echinococcus cyst is a possibility in a foreigner. Needling is undesirable when such a cyst is suspected, as puncture may be followed by the escape of fluid into the space between the wall of the sac and the connective tissue capsule. Was there a history of contact with dogs for herding sheep, and was an echinococcus fixation test done?

DR. MALLORY: I am sure that the latter was not done.

DR. LORD: The absence of eosinophilia and the sense of solid resistance on tapping are against an echinococcus cyst. Pure blood on tapping suggests the possibility of an aneurysm, which may or may not pulsate. What about the Hinton test?

DR. MALLORY: I could find no record of it. He had been in the Out Patient Department on frequent occasions, however, and I assume that it was done there and was negative.

DR. LORD: A Hinton test would be desirable, but I think the presence of an aneurysm is improbable, as well as that of a cold abscess. Solid tissue on tapping may serve to exclude these conditions.

To come to the possibilities that are not so readily excluded, all have to do with some kind of tumor. It might be ganglioneuroma, but tumors of this sort are commonly in the posterior part of the chest. With intrathoracic lipoma, the needle is not likely to meet such resistance. Substernal goiter, cystic tumor of the thymus, bronchiogenic cystic tumor or cystic lymphangioma should be considered. On the whole, however, if one bases the supposition on the doctrine of chance rather than on evidence, it seems more likely that this is a dermoid

or a teratoma. They occur in the anterior rather than in the posterior part of the chest, are relatively common compared with other conditions mentioned, are resistant on tapping, and are spherical and, at times, lobulated. They may rupture and give rise to watery sputum. So I would say that the process is probably a nonmalignant tumor, a dermoid or teratoma being the most likely, and that it may have undergone malignant degeneration.

DR. HAMPTON: I could have helped a little more by enlarging upon that rib problem. I wonder if the local erosion would suggest to you that it might have started in that area instead of near the middle.

DR. LORD: Before your interpretation I was looking upon the rib destruction as erosion rather than involvement of the rib and extension therefrom. I do not see anything in this picture that suggests primary malignancy of the rib.

DR. HAMPTON: No, but these ribs are equally pressed upon by the tumor, apparently, and yet there is one rib that shows more than the others. I wonder whether you would change your opinion if we could show that the tumor originated in that area.

DR. LORD: It might suggest an origin in the left side and anteriorly rather than posteriorly.

DR. MALLORY: We gave Dr. Lord the report of the first x-ray. We did not give him the diagnosis made by the x-ray department at that time. They made a flat-footed diagnosis of tumor of the pericardium in 1926.

DR. DONALD S. KING: The tumor apparently had increased gradually in size in that interval. Our reasoning was about the same as Dr. Lord's. We thought it was more like a dermoid cyst, but the marked increase in size made us favor malignancy.

CLINICAL DIAGNOSIS

Teratoma of the mediastinum.

DR. FREDERICK T. LORD'S DIAGNOSIS

Benign tumor, probably dermoid or teratoma: ? of malignant degeneration.

ANATOMIC DIAGNOSES

Fibrosarcoma, slowly growing, of the mediastinum.

Operative wound: left exploratory thoracotomy with rib resection and biopsy.

Pleuritis, chronic fibrous, obliterative.

Pulmonary atelectasis, partial, right lung; complete, left lung.

Pericarditis, chronic fibrous, adhesive.

Compression of the venae cavae.

PATHOLOGICAL DISCUSSION

DR. MALLORY: We have seldom succeeded in making a correct preoperative diagnosis as to the nature of one of these mediastinal tumors, and in this case again, what seemed like the most reasonable bet was wrong. The tumor was a very large fibroma or a slowly growing fibrosarcoma, which was so intimately adherent to the anterior surface of the pericardium that it could not be separated from it. In dissecting the tumor out, it was evident that it arose in front of the phrenic nerve, which was pushed way back into the posterior part of the chest, so that it was quite evidently a tumor primary in the anterior mediastinum either in or on the surface of the pericardium. It had rotated very far to the left, so that it completely filled the left thoracic cavity, except for a small portion near the base where the completely collapsed left lung was found. The right lung showed a slight degree of aeration but was also markedly collapsed, and the heart was pushed over into the right chest. There was nothing to suggest that the tumor had any connection with the rib.

DR. HAMPTON: How do you explain the erosion in the rib?

DR. MALLORY: Pressure, I suppose. We found nothing else.

DR. LORD: It is quite unusual, is it not?

DR. MALLORY: Yes, I think that it is distinctly unusual for a solid tumor to erode a rib.

A PHYSICIAN: Do you think that it might have started as a nonmalignant tumor and became malignant?

DR. MALLORY: Even at the time of autopsy it was of only a questionable degree of malignancy. I think in all probability that in 1926 it would have been perfectly benign.

DR. KING: Sarcoma is coming back into its own in our experience. We have had 4 cases this year.

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CAN FEE-SPLITTING BE MADE ETHICAL?

DR. HAROLD HAYS, of New York City, president of the Association of Private Hospitals, is reported in the *New York Times* to have alleged that over sixty per cent of the 14,000 physicians in New York City are "probably" engaged in the "pernicious practice" of fee-splitting.

Dr. Hays proposes that a fifteen per cent grant of the fee charged by a specialist be allocated to the practitioner who sends a case to the specialist. This he contends might be a fair method of dealing with the practitioner and the patient. He believes that this practice would tend to do away with fee-splitting because it would not be a secret arrangement. The further contention is submitted that this division of fees, if approved by medical societies, might be made legal.

In this connection the resolutions adopted by the Council of the New York Academy of Medicine introduced herewith are of interest.

"The Council now wishes to reaffirm its stand taken when it addressed to the Fellowship of the Academy, on November 17, 1930, a letter re-endorsing the Academy's adoption of the following resolution of May 24, 1911:

"RESOLVED that the secret division of a fee, or fees, with any person, or persons, who may be instrumental in influencing a patient, or patients, to apply for operative care or professional advice, is unworthy of any member of the medical profession.

"RESOLVED that if such a division of fee is made by a member of the New York Academy of Medicine, it should be counted as of sufficient ground for the expulsion of the member.

"RESOLVED that the Council considers it its duty to investigate charges against members made on the basis of such division of fee, and on receipt of proof of offense the Council may either permit the resignation of the person or expel* him from the Academy.

Although Dr. Hays in his arguments adopts the words "secret division of fees", which appear in the resolutions of the Academy, there arises the fear in some minds that, even if there is no secrecy in the distribution of this fifteen per cent, there may be grounds for suspicion of possible irregularities inherent in any form of fee-splitting, which might be unjust to the patient.

In the first place, there is no likelihood that all competent specialists will agree to be collection agents for the disbursement of the percentage to be paid to the family doctor, and secondly, if the custom is not generally adopted, those who participate in this plan may be, in certain instances, the alleged fee-splitters now operating and who may be in collusion with the family adviser to agree to exorbitant charges and unnecessary operation.

Any form of fee-splitting may, we believe, open the way to unfair treatment of patients. A personal communication from Dr. Galdston, executive secretary of the Medical Information

"*The present constitution of the Academy provides that the Council may only recommend expulsion to the membership."

Bureau of the New York Academy of Medicine, assures us that the Council of the Academy does not endorse Dr. Hays's proposal. The medical profession in general, we believe, will not approve the plan proposed.

FURTHER ADVANCES IN THE MILK INDUSTRY

A GLANCE at the legal standards for certified, grade A and market milk, effective in Boston, demonstrates immediately the potential, as well as the actual, superiority of certified milk to the others. The allowable bacterial count for raw certified milk is 10,000 per cubic centimeter and for pasteurized certified milk is 500; for raw Grade A milk the permissible count is 100,000 and for pasteurized is 10,000; for market milk the corresponding counts are 400,000 and 40,000. Certified milk is the only milk permitted to be sold in Boston in its raw state.

The maximum allowable age of milk before pasteurization is 24 hours for certified, 48 hours for Grade A and 72 hours for market milk; cows producing certified milk are tuberculin tested at least twice yearly, and are tested for the presence of *Brucella abortus;* cows producing grade A and market milk are tuberculin tested at least every 3 years and are not required to be tested for *Brucella abortus.*

Farms producing certified milk have medical supervision of employees at least weekly and veterinary examination of cattle at least monthly; the milk must be bottled and sealed at the farm and delivered to the consumer within 30 hours. Grade A and market milk farms have no required medical supervision of employees, are not required to bottle at the farm, have no established time limit on delivery, and have required veterinary inspection only twice yearly in the case of grade A farms and yearly in the case of those farms producing only market milk.

Actually, these differences in a city such as Boston with its adequate health supervision are not so great as the minimum standards would indicate. Practically all milks marketed exceed the standards by a wide margin, and pasteurization of all but a proportion of the certified milk puts the final seal of safety on this important part of our food supply.

Various methods of increasing the vitamin D content of cow's milk have been practiced during the last few years, and the Council on Foods of the American Medical Association has at last announced its acceptance of the following types:

1. Irradiated fresh and evaporated milk, produced under Steenbock patent, containing 135 units of vitamin D to the quart of fresh milk or the reconstituted quart of evaporated milk.
2. Fresh milk containing a concentrate of cod liver oil (Vitex) with 400 units of vitamin D to the quart, and evaporated milk containing the same number of units to the reconstituted quart.
3. Fresh milk containing 400 units of vitamin D to the quart, the vitamin D being prepared from ergosterol by a process of activation different from the photochemical process previously described in the scientific literature.
4. Evaporated milk containing a cod liver oil concentrate made by the Clo-Dee (Barthen) process and containing 400 units of vitamin D to each 14½ ounces by weight.
5. Various mixtures designed for infant feeding containing cod liver oil or other sources of vitamin D. Dried milk preparations fortified with vitamin D have also been accepted.

This action of the Council at last puts on an accepted basis the theoretically logical fortification of milk with vitamin D. The effect of this on the popularity of "natural" vitamin D milk from cows fed on irradiated yeast is yet to be seen.

THE COMBINED CLINICAL MEETING

As part of the program of the annual meeting of the Massachusetts Medical Society, it has been customary to hold clinical meetings in the various hospitals. Due to certain conflicts in schedule in the past, criticism of this procedure has arisen both from the hospitals arranging the programs and from the visiting practitioners. Therefore, this year the Committee of Arrangements has endeavored to put on an interesting program in one place,—the headquarters of the annual meeting,—where hospital staffs have been invited to participate and demonstrate certain phases of disease and the present-day methods of diagnosis and treatment.

A varied program of general interest has been arranged, and one whole day, June 2, will be devoted to this alone. It will not conflict with the usual meetings of the various sections on dermatology, physical therapy, tuberculosis, obstetrics and gynecology, pediatrics, medicine and surgery. The meeting will be held at the Hotel Bradford, and transportation problems to and from clinics are eliminated. The Committee regrets that it has been compelled to refuse forty suggested topics, but the time, unfortunately, is limited and twenty-six topics seem to be the maximum that can be well presented. The response and enthusiasm from the hospitals have been overwhelming, and the Committee hopes that the selected program will be of sufficient interest to the members attending this meeting to have the hall well filled.

The Committee has been fortunate in obtaining Dr. Leslie T. Webster from the Rockefeller Institute as the principal speaker. He will talk on "The Increasing Incidence of Rabies: Its Control and Treatment." An accepted authority on this subject, which is a topic of particular interest in this State where the disease is becoming prevalent, Dr. Webster will bring to us the most up-to-date methods for the solution of this problem. Last year in Massachusetts there were 10,129 dog bites reported, and 108 positive heads of dogs were found among the 335 submitted for examination. Even more startling, however, is the fact that 611 human beings suffering with dog bite were submitted to some form of immunizing treatment. Are we needlessly submitting some patients to the discomforts and expense of immunization? To this and other questions we are awaiting with interest Dr. Webster's counsel and suggestions.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

PEPPER, O. H. PERRY. M.D. University of Pennsylvania School of Medicine, 1908. Professor of medicine, University of Pennsylvania. Address: University Hospital, 36th and Spruce streets, Philadelphia, Pa. His subject is "The Importance of Detail in the Art of the Care of the Patient." Page 773.

BARNEY, J. DELLINGER. M.D. Harvard Medical School, 1904. F.A.C.S. Chief-of-service, Urological Department, Massachusetts General Hospital. Assistant professor of genito-urinary surgery, Harvard Medical School. Address: 87 Marlboro Street, Boston.

KELLEY, SYLVESTER B. M.D. Harvard Medical School, 1929. Assistant urologist, Massachusetts General Hospital. Address: 87 Marlboro Street, Boston. Their subject is "Urologic Complications of Cancer of the Rectum." Page 779.

ROSENTHAL, JOSEPH. M.D. Tufts College Medical School, 1926. Assistant physician, The Boston Dispensary. Senior physician, Diabetic Clinic, The Boston Dispensary. Assistant in medicine, Tufts College Medical School. Address: 491 Commonwealth Avenue, Boston.

FINKELSTEIN, HELEN E. B.S. Simmons College. Associate dietitian, Food Clinic, The Boston Dispensary. Address: 25 Bennet Street, Boston. Their subject is "Treatment of the Ambulatory Diabetic Patient with Protamine Zinc Insulin." Page 784.

WEILLE, FRANCIS L. M.D. Harvard Medical School, 1925. Assistant surgeon, Massachusetts Eye and Ear Infirmary. Assistant in otolaryngology, Harvard Medical School. Address: 395 Commonwealth Avenue, Boston.

BILLINGS, BRUCE H. B.A. Harvard, 1936. Address: 7 Ashton Place, Cambridge. Their subject is "A Study of the Efficiency of Carbon Microphone Hearing Aids." Page 790.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY*

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R. J. HEFFERNAN, M.D., *Secretary*, 1101 Beacon St., Brookline, Mass.

No. 18. CASE HISTORIES

RUPTURED ECTOPIC PREGNANCY—OPERATION—TRANSFUSION—ANAPHYLACTIC DEATH

Mrs. X., a white woman, 38 years old, was seen on February 7, 1930. She had had an attack of severe pain while at dinner and had fainted.

There was no family history of tuberculosis, diabetes, malignancy or hemorrhagic disease. Her mother had died at childbirth. Her father had died at the age of 55 of "angina". She had never had scarlet fever, pneumonia or rheumatism, but she had had frequent sore throats. "Glands in the neck" had been operated on when she was 5 years old and again when she was 11

*A series of selected case histories by members of the Section will be published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the Section.

years old. She had had two infected wisdom teeth removed. A tonsillectomy had been performed in 1917. She had had a laparotomy for sterility, at which time the ovaries were resected, the appendix removed and the uterus suspended.

Her periods had begun at 11 years, and they were at that time very irregular, always too early and very profuse. Since her operation they had been from 10 days to 2 weeks late. She had had one pregnancy, which was terminated by cesarean section in July, 1928. Her convalescence was normal and uneventful. She had had her last regular period on November 29, 1929, and had had a slight amount of staining in December. There had been no flowing of any description since. She was not flowing when seen.

On physical examination she was a short, well-developed woman whose normal weight was around 130 pounds. Her teeth were well cared for. The mucous membranes were very pale, and she was sweating profusely. Her lungs were normal and resonant throughout, and there were no rales. Her pulse could not be felt at the wrist, but the apex beat was 120. Her blood pressure could not be obtained; her temperature was 98°F. The entire right side of the abdomen from the ribs to the pubes was very tender. There was no shifting dulness. She was immediately moved to the hospital by ambulance. The diagnosis of an acute abdomen, probably a ruptured extrauterine pregnancy, was made. Her white blood cell count was 22,000.

A consultation was held and the surgeon made a provisional diagnosis of ruptured duodenal ulcer because of the localization of acute pain under the ribs on the right. An operation was postponed because the patient was in extreme shock. One hour later the pulse came down to 112 at the apex; still no radial pulse was obtained. In another hour her pulse had gone up to 120, and she became more pallid. An immediate operation was decided upon, and the patient was transfused as the operation was performed. The donor was a medical student, and the blood was directly matched and reported compatible. At operation the abdomen was found to be filled with blood, some quite fresh and some clotted. The right tube had ruptured 2 centimeters from the fimbriated end. The tube was removed, and the abdomen was closed in layers. The patient's condition at the end of the operation was very poor. She was very cyanotic and looked as if she were dead. One-half hour after the operation, however, she was somewhat better, and her pulse was obtained at the wrist for the first time. Three hours later her pulse had gone up to 156, her temperature had risen to 105°F., and she was in extreme shock. Four hours later she was again transfused. Her husband's blood was compatible, and he was the donor. This was on February 8.

February 9 the patient's temperature ranged from 98.6 to 99.8°F., and her pulse came down from 140 in the morning to 120 in the afternoon. There was no vomiting and the abdomen was negative. On February 10, the patient voided 7 ounces of urine in the morning and 2 ounces at 6 p. m. Catheterization obtained no more. Both specimens contained albumin and casts. There was no vomiting and the abdomen was negative. From 6 p. m. on February 10 to 7 a. m. on February 11, the patient voided 1½ ounces of urine. Her blood pressure was 130. The urine contained a large trace of albumin and casts, and there were some rales heard at the right base. A medical consultation was held, and the patient was given 1,000 cubic centimeters of 5 per cent glucose solution. There was no vomiting or abdominal distention. The blood nonprotein nitrogen was 120 and 150 milligrams per 100 cubic centimeters.

On February 12, the patient's temperature was 102°F. in the morning, and her pulse was 120. Her temperature was 101.8°F. in the afternoon, and her pulse was 138. She was very drowsy, her eyes and face were edematous, and she was definitely toxic. After the morning of February 11, the patient was catheterized every 6 hours, and not more than 1¼ ounces of urine was obtained each time. These specimens were loaded with albumin. The blood nonprotein nitrogen was 102 and 175 milligrams. On the morning of February 13, the patient's temperature was 102.8°F., and her pulse was 118. In the afternoon her temperature was 103.2°F., her pulse was 132, and her respirations were up to 38. She was more edematous and was in coma. The blood nonprotein nitrogen was 180 milligrams.

Mrs. X. died on the morning of February 14. The autopsy revealed acute hemorrhagic nephritis due to anaphylaxis following transfusion. There was no bleeding from the site of the operative wound. One kidney weighed about 800 grams, the other over 600 grams. Nothing else was found.

Comment. The extreme collapse with the sharp, sudden pain is not so frequently seen in ruptures of the tube near the fallopian end as in those that occur at the cornual end. The localization of pain in the epigastrium, which in this case led to a presumptive diagnosis of ruptured duodenal ulcer, is not an uncommon localization when there is a great deal of blood in the abdominal cavity. In such acute emergencies, operation with accompanying transfusion is the proper procedure if it is felt that immediate operation cannot be postponed.

This case illustrates the unfortunate danger inherent upon all transfusions. The first donor belonged to group IV: the blood was matched directly with that of the patient and was said to be compatible. Her temperature rose to

105°F. within 3 hours of the transfusion, which, with the picture of pallor and cyanosis, showed that the transfusion had not been successful. The acute urinary suppression, which is now definitely recognized as a symptom of incompatible blood transfusion was treated, at that time, by glucose, forced fluids, digitalis and caffein sodium benzoate. The operation of decapsulation of the kidney was considered and rejected. It is known today that such an operation on cases of urinary suppression following transfusion frequently results in recovery.

COMPENSATION OF PHYSICIANS

April 29, 1937.

Editor, *New England Journal of Medicine*,

The enclosed letter from Mr. William A. Kneeland, the counsel of the Public Relations Committee, is self-explanatory. The committee earnestly recommends that physicians seeking compensation under the Workmen's Compensation Act follow carefully the procedure as outlined below. The committee is prepared to offer legal assistance in any case which promises to clarify the present uncertainty of the right of a staff physician to obtain payment for his services in this type of work.

The Public Relations Committee proposes to issue shortly a manual of procedure to be followed in these cases, relative to the free choice of physician by the patient and the testimony necessary to establish a claim for compensation at a hearing before the Industrial Accident Board.

Yours very truly,

J. HARPER BLAISDELL, M.D., *Chairman*,
Subcommittee on Hospitalization,
Public Relations Committee.

45 Bay State Road.
Boston.

March 17, 1937.

Dr. J. Harper Blaisdell
Chairman of Subcommittee of Massachusetts
Medical Society on Hospitalization
45 Bay State Road
Boston, Massachusetts.

Dear Dr. Blaisdell:

Since I rendered your committee an opinion last winter upon the right of a physician on the staff of a public or charitable hospital to obtain payment for treatment of an injured employee from the insurer under Section 30 of Chapter 152 of the General Laws (Workmen's Compensation Act), two developments have arisen.

In the first place, Section 30 was amended at the last session of the legislature by striking out the provisions providing for compensation from the insurer to physicians where they had furnished treatments in an emergency or for other justifiable cause. This amendment, in my opinion, seriously abridges the authority of the Industrial Accident Board to allow compensation to physicians for services and the right of physicians to secure it, as it limits the recovery of compensation by a physician to those cases in which a selection of the physician has been properly made by the employee, irrespective of the need of emergency or other justifiable treatment.

In the second place, you have asked me to review the recent decision of the Board in the case of Dr. F. Leon Gage of Lowell, denying him compensation for treatment rendered to an employee while confined in a hospital of which Dr. Gage was a staff physician. This decision was sustained by the Superior Court, to which Dr. Gage appealed, on the ground that the Board's findings of fact should stand and that there was no question of law involved.

Before considering Dr. Gage's case in detail, I believe that an explanation of the rights of a party who has been prejudiced by a finding of the Board should prove helpful in enabling the members of your Society to understand the legal features of the matter.

In the case of an adverse finding, the aggrieved party has a right of appeal to the courts on questions of law alone. The Board's findings of fact are final and conclusive, unless the Courts can find, as a matter of law, that there was no evidence upon which these findings can be based. The Supreme Court has repeatedly held that it will not interfere with findings of fact made by the Board, which has had an opportunity to see and hear the witnesses, except in cases where its findings of fact were wholly unsupported by evidence or were based on mere conjecture and surmise rather than evidence.

I shall endeavor to illustrate these points by examples:

(1) If the Board should find as a fact that an employee has made a selection of a staff physician and then should deny compensation to the physician on the ground that he was not entitled to it under the Act, this would present a question of law for interpretation of the meaning of the Act. Thus there would be a right of appeal on this question of law to the Courts.

(2) If conflicting evidence were introduced before the Board on the question of such a selection and the Board should find that no selection had been made, this would be a finding of fact, and no appeal to the Courts would lie, as there was evidence upon which the Board could base its findings.

(3) If, however, all the evidence introduced before the Board should show a selection and it should find as a fact that no selection had been made, this would present a question of law and an appeal would lie, as there was no evidence to support the Board's finding of fact.

In Dr. Gage's case, the hearing at which all of the evidence was taken was held before a single member of the Board. Two questions were considered: (1) the right of the employee to continued compensation and (2) the right of Dr. Gage to payment from the insurer for his treatment of the employee both at the hospital and after his discharge. Dr. Gage was not represented by counsel, but all of the other parties were.

The evidence introduced on the question of the selection of Dr. Gage by the employee was as follows, as reported by the single member of the Board who heard it:

"*Dr. Gage testified:* That he first saw the injured employee on February 2, 1935, about 7:30 in the morning at St. Joseph's Hospital. . . . He specializes in medicine and surgery and is a member of the staff of St. Joseph's Hospital. . . . He is on the staff of the hospital there. . . . He was on the staff on February 2, 1935, is on the staff right along, all the year around. He was on the staff there during the time this employee was confined to the hospital. The employee was discharged from the hospital on April 20. . . . He is on the staff of St. Joseph's Hospital twelve months in the year, but he is on service during the months of December and January. . . . Mr. Welch (the employer) specified that he take care of him. He was called to take care of him as a private patient. He is on service at the hospital in December and January. This accident happened February 2. The employee specifically asked that the witness take care of him.

"*The employee testified:* That on the morning he was injured he was taken to the hospital. . . . He did not know any of the doctors at the hospital but he knew Dr. Gage, the latter having been his family doctor for years. So he asked to have Dr. Gage. . . . He talked with one of the nuns in the first-aid room about Dr. Gage. That was as soon as he got to the hospital. He cannot recall when Dr. Gage treated him previous to that time, maybe it was ten years before. As soon as he was in the accident room . . . he asked for Dr. Gage. He did not ask anybody in particular to call Dr. Gage. The intern was there and a nun and one or two nurses. He said: 'Please call Dr. Gage.' Anybody might have heard him. He assumed it was the sister who heard him, as she was there. . . . He did not speak to anybody in particular but the sister was nearest to him. . . . Nothing was said by anybody but witness just said: 'Send for Dr. Gage.' . . . Previous to this injury from time to time he had had Dr. Gage treat members of his family."

Upon the above evidence, the Board found *as a fact* that the employee did not make a free choice of a physician, and refused to allow Dr. Gage compensation for his treatment of the employee while in the hospital. It found, however, that Dr. Gage had rendered necessary specialized or surgical treatment to the employee after he was discharged from the hospital, and allowed him compensation for such treatment.

In its decision, the Board summarizes the evidence as follows: "The employee was injured on February 2, 1935, and was taken to St. Joseph's Hospital at Lowell, Mass. He testified that while in the first-aid room he said: 'Please call Dr. Gage.' At the time there were present three or four persons and this request was directed to no one in particular. Dr. Gage testified that he took care of the employee as a private patient. Dr. Gage was a member of the staff at St. Joseph's Hospital prior to the time the employee was brought to the hospital, during all of the time he treated him at the hospital and continues to be a member of the staff at the hospital."

It will be noted that the Board in this summary ignored any reference to Dr. Gage's testimony that he was not "on service" while he was treating the employee at the hospital.

The Board reiterated its rule that "an industrial case coming into the hospital as a hospital case cannot be made into a private case in which the attending physician may collect from the insurance company for his service as in a private case."

This decision of the Board confirms its position that it does not propose to allow compensation to a staff physician of a hospital for treatment rendered an injured employee in such hospital, however strong the evidence may be to show of the selection of such physician by the employee, if it can possibly avoid such a finding.

As I have pointed out, the finding of the Board in the Gage case was one of fact, and the Superior Court, to which an appeal was taken, was obliged to hold that the appeal did not lie, as it found that there was evidence upon which the Board's finding could be sustained.

Although, in my opinion, upon the evidence, Dr. Gage was the free choice of the injured employee and the Board's finding to the contrary was erroneous, nevertheless the evidence was not presented to the Board in a manner to make such a conclusion inescapable. The Board obviously desired to find that there had been no free choice, probably for the purpose of preventing a judicial review, as a matter of law, of its established rule against allowing compensation to staff physicians, and unfortunately the evidence was so incomplete and indefinite that the Board could refuse to find a free choice.

However, I feel that this was a case in which, if all available evidence had been presented to the Board, a finding for Dr. Gage would have had to have been made or else a good appeal would have been possible to the Courts.

In order to assist the members of your Society in the event of a similar situation arising hereafter, it may be valuable to point out how the evidence could have been presented either to compel a finding of a "free choice" or to sustain an appeal.

Dr. Gage should have testified that he was one of an approved group of physicians who could bring their patients to the hospital for treatment, and that only in this sense was he on the staff throughout the year; that during the months of December and January he was "on service" at the hospital, which meant that he was present at the hospital during certain hours each day, and on call the remainder of the day, to treat any cases brought to the hospital; and that except during these two months he was under no obligation to render free service to the

patients of the hospital. This testimony should have been corroborated by someone in authority from the hospital.

Dr. Gage should have testified that someone telephoned him to come to the hospital to treat a private case at the request of the injured person, and that he responded to this call, but would not have seen or treated the employee otherwise, as he was not "on service" at the time. The person who called Dr. Gage should have confirmed this telephone conversation and should have testified that the patient requested him or her to secure Dr. Gage to treat him. Someone representing the hospital should have also testified that, in the absence of such selection of Dr. Gage, the employee would have been treated by some physician in attendance at the hospital or on service at the time.

As I stated in my earlier opinion, I feel that the rule of the Board relative to staff physicians in industrial cases will not be sustained by the Supreme Court, if the evidence presented will justify no conclusion other than that the staff physician was the free choice of the injured employee, in spite of an adverse finding of the Board. No such case has yet been presented to the Supreme Court. Moreover, Dr. Gage's case emphasizes the difficulty of getting such a case before the Courts, as the question involved is one of *fact*, as I have pointed out before.

I agree with your committee that the interests of the medical profession demand that a ruling be obtained from the Supreme Court of Massachusetts defining the rights of staff physicians to compensation from insurers for services rendered to injured employees, especially in view of the present hostile attitude of the Board. However, in my opinion, no such ruling can be obtained unless the evidence is presented to the Board in such form that a free choice of the staff physician by the injured employee is conclusively shown. Then an appeal to the Supreme Court will present a clear issue of law to it.

Accordingly, I recommend that your committee strongly urge the members of your Society to be represented by competent counsel at all hearings upon this issue before the Board, or a member thereof, at which the evidence is to be heard. In case your members do not care to select their own counsel for this purpose, I furthermore recommend that the evidence be taken up with your committee seasonably before the hearing, in order that your committee may secure counsel to represent the physician seeking compensation, if in its opinion the case is proper to enable a test of this issue.

Yours very truly,

WILLIAM A. KNEELAND,
Counsellor at Law.

18 Tremont Street,
Boston.

MASSACHUSETTS LEGISLATIVE NOTES

Action was taken by the Legislature last week on the following bills of interest to the medical profession:

House Bill 34. Recommendation of the board of registration in medicine relative to providing for annual registration of physicians and annual publication of the list of physicians duly registered. Rejected on the third reading by a vote of 77 to 142.

House Bill 1200, Appendix 40. An act providing for the care of premature infants. Report of Special Health Commission. Passed to be engrossed.

MISCELLANY

MAINE NEWS

As a result of the recent membership drive in Maine by the Women's Field Army of the American Society for the Control of Cancer under the able leadership of Mrs. William Holt, of Portland, the sum of $13,000 was raised. This is considered an excellent showing for a rural state.

At a recent meeting of the state Advisory and Executive Committee, it was voted that the expenditure of this fund for x-ray and radium treatment for needy patients should be placed in the hands of a volunteer state commander, who should have headquarters in Portland, and an executive secretary to help carry on the work. Mrs. Holt was chosen to continue as state commander.

Patients eligible to receive aid or those whose hospital expenses are assumed by the town or city from which they come must be acceptable to the hospital aid division of the State Bureau of Welfare. The cost of treatment is to be determined by the advisory board after receiving estimates from all of the state clinics so that uniform fees may be agreed upon.

Physicians throughout the state are still giving radio taiks and lectures before groups in the smaller communities. A very creditable amount of enthusiasm has been stirred up in the state regarding cancer education.

SURGEONS WILL TAKE SCANDINAVIAN TOUR

The Society of Clinical Surgeons, following their time-honored tradition of taking a trip abroad approximately every five years, will pay their first visit as a society to Scandinavia this July. They have invited members of the Interurban Surgical Society, with their families, to join in the tour and the two groups will sail July 2 under Cook's auspices on the S.S. Gripsholm. They will visit the outstanding clinics of Denmark, Sweden and Norway, which have been attracting much attention in recent years, and will combine scientific interest with the recreational and sightseeing features of a holiday abroad, continuing on to England and Scotland before returning to the United States.

The Society of Clinical Surgeons visited Great Britain in 1910, Germany in 1912, France, Italy, Austria and the Netherlands in 1925, and the British Isles again in 1930. This summer's Scandinavian tour will cover Gothenburg, Copenhagen, Stockholm, Oslo, Ulvik, Stalheim, Voss and Bergen. Proceeding thence by steamer to Newcastle, the society will round out its trip with visits to London, Edinburgh, the Trossachs and Glasgow, arriving in New York via the S.S. Caledonia August 16.

Cook's conducted a similar trip last year for the Southern Society of Clinical Surgeons.

CONVERSE HOUSE

The New England Baptist Hospital opened its new six-story brick building, The Converse House, on Saturday, April 24, at dedication exercises presided over by Albert H. Curtis, president of the hospital corporation.

The new building, which has been named for Mr. and Mrs. Costello C. Converse, of Boston, contains six major and four minor operating rooms on the first floor. The upper four floors are for private rooms, while the basement is for clinical laboratory work, and contains complete x-ray equipment.

AMERICAN COLLEGE OF PHYSICIANS

Among the 119 physicians elected to associate membership at the annual meeting of the American College of Physicians, recently held at St. Louis, were the following: Theodore Learnard Badger, James Harvey Townsend, and Carl Edward Trapp, all of Boston; Ira Milburn Dixson, of Stockbridge, and Robert Thornhill Monroe, of Brookline.

LONG-TERM SCHOLARSHIPS AT HARVARD MEDICAL SCHOOL

Selection of the three outstanding candidates for admission to the Harvard Medical School next fall as holders of the first prize fellowships offered by the school under the University's new "long-term" scholarship was announced recently.

The Medical School is the third graduate department of the University to adopt the plan which President James B. Conant introduced in Harvard College in 1934, and which has since been put into effect in the Graduate School of Arts and Sciences and the Graduate School of Design. The Law School and the Graduate School of Education have also approved the principles underlying the system, and will introduce it as new funds permit.

Students chosen as the first prize fellows of the Medical School are Ward S. Fowler, of Eldora, Iowa, senior at Swarthmore College; Carl C. Gardner, Jr., of Columbia, Tenn., senior at Vanderbilt College, and William F. Loomis, of Tuxedo Park, N. Y., senior at Harvard College.

Fowler is a candidate for honors in the division of mathematics and natural sciences; for four years he has held an "Open Scholarship," one of the high academic distinctions of Swarthmore. He has studied at the Marine Biological Laboratories at Woods Hole, Mass., under a departmental scholarship from Swarthmore. He has been a member of the varsity football, track and soccer teams, concertmaster of the student orchestra, director of the band, and a member of the glee club and quartet.

Gardner is one of the top-ranking students of his class, and has been elected to the Skull and Bones, honorary premedical club. He is a member of the debating team and of the Student Christian Association cabinet.

Loomis is a high honor student in biochemistry at Harvard, a member of the varsity ski team and an officer of the Mountaineering Club. He was a member of the British-American Himalayan Expedition of 1936, which climbed Nanda Devi, highest peak ever reached by man.

These men were selected as the most promising scholars among those entering the Medical School next fall. As in the other schools where the scholarship plan is in force, the awards are made primarily without regard to financial need, and solely on a basis of ability, character and school record. Once the men have been chosen a fundamental "sliding scale" feature comes into play, and the winners receive stipends sufficient to enable them to attend Harvard without "working their way through." At the Medical School the maximum stipend will be $1,200 a year.

In the College and the other graduate schools under the plan, students make special application for the fellowships, but by a unique feature of the new Medical School program every applicant for admission to the school is automatically considered as a candidate for the prize awards.

Donations of over a million dollars to the Harvard Tercentenary Fund last year, given especially for the fellowships, have made possible the extension of the system in the College and through the graduate schools. Of this money, Edward S. Harkness, of New York, gave $100,000, and Dr. Daniel F. Jones, Harvard '92, of Boston, gave $25,000, particularly for such awards in the Medical School.

With the money now available it is planned to award at least two of these fellowships a year at the Medical School. At first the men will receive stipends for one year, and if they maintain a high honor standing in their work, the awards will be renewed for the remaining three years, under the long-term provisions of all the Harvard prize scholarships. Students will be expected to remain single while receiving the stipends.

In his recent report to the President, Dean C. Sidney Burwell, of the Medical School, emphasized the especial need of this department for large scholarships to encourage scholastic attainment. He pointed out that the ordinary student methods of financing an education—by assuming debts and working outside—are not good solutions for the medical men.

"The medical curriculum is so full, and its opportunity so abundant, that remunerative work simply takes away from the medical student opportunities

which he can ill afford to lose," he said. "Inferior work on the part of medical students is sometimes traced to the amount of time they spend in remunerative work, and occasionally breakdowns in health result from the same cause."

CORRESPONDENCE

OFFICIAL ACTION OF THE BOARD OF REGISTRATION IN MEDICINE

State House, Boston

April 22, 1937.

Editor, *New England Journal of Medicine,*

This is to inform you that, in accordance with the vote of the Board of Registration in Medicine, the license of Dr. Arthur E. Brides, of Stoughton, suspended on December 10, 1936, was restored to him on April 20, 1937.

Yours very truly,

STEPHEN RUSHMORE, M.D., *Secretary.*

SPECIAL REGISTRATION PLATES

April 26, 1937.

Editor, *New England Journal of Medicine,*

It seems to me that the time has come when steps should be taken to obtain parking privileges for legally registered doctors while carrying on professional business.

I would suggest that special registration plates, with M.D., or some other identifying mark after the number, be issued to doctors who are authorized by the Board of Registration in Medicine to practice in Massachusetts.

Very truly yours,

WALTER S. LEVENSON, M.D.

370 Commonwealth Avenue,
Boston.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Illinois,

April 6, 1937.

Managing Editor, *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of February 27 the following have been accepted:

Abbott Laboratories
- Tablets Acetarsone—Abbott, 0.1 Gm.
- Tablets Acetarsone—Abbott, 0.05 Gm.
- Tablets Calcium Gluconate—Abbott (Flavored), 1 Gm.

Campbell Products, Inc.
- Novatropine
  - Novatropine Tablets 1/24 grain

Eli Lilly & Co.
- Tetanus Toxoid, Alum Precipitated (Lilly)

National Aniline & Chemical Co.
- Aminopyrine—"National"
  - Aminopyrine Tablets, 5 grains

National Drug Co.
- Antipneumococcic Serum—Felton—Type II (Refined and Concentrated)

Sharp & Dohme, Inc.
- Diphtheria Toxoid, Alum Precipitated, 1 cc. vial package
- Diphtheria Toxoid, Alum Precipitated, ten 1 cc. vials package
- Diphtheria Toxoid, Alum Precipitated, one 10 cc. vial package
- Tetanus Toxoid, Alum Precipitated, Refined
- Protamine Zinc Insulin
  - Protamine Zinc Insulin, 10 cc.

Winthrop Chemical Co., Inc.
- Salyrgan Suppositories

The following product has been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N.N.R. (New and Nonofficial Remedies, 1936, p. 471):

National Aniline & Chemical Co., Inc.
- Phenolsulfonphthalein

Yours sincerely,

PAUL NICHOLAS LEECH, *Secretary.*

RECENT DEATH

STURGIS—BENJAMIN FRANKLIN STURGIS, JR., M.D., of 26 Pleasant Street, Salem, died on April 29 after a long illness. He was in the sixty-third year of his life.

A native of Auburn, Maine, Dr. Sturgis attended Bates College and was graduated from Bowdoin Medical School in 1908. After serving his internship at the Salem Hospital, he established his private practice in Salem. He was a member of the exemption board during the World War and held the rank of captain in the Second Corps Cadets of Salem.

He was a former member of the Massachusetts Medical Society.

Two brothers, Dr. Karl B. Sturgis, of Powell, Maine, and Alfred Sturgis, of Portland, survive him.

OBITUARIES

DR. WALTER HENRY CHAPIN

Dr. Walter Henry Chapin, physician, scholar, poet, died at his home in Springfield, April 2. Student and scientist, his lifelong urge was the acquisition of knowledge, and in this he outdid most men. He read Hebrew, Greek and Latin. He knew the birds, the insects and the beasts. The rocks were to him an open book of history for a million years. He called the flowers of field, swamp and mountain by name, knew their structures and where to find their hiding places. He delved deeply into the Bible, his spirit moved by the beauty of its song and poetry, his mind questioning its origins, its issues and its contradictions.

A family doctor of the old school, he was as faithful to his patients as they were loyal to him. He

was best as diagnostician. It was the puzzle that called him. Challenged by problems of public health, he was for several years city physician, for a long time medical inspector of schools and, from its beginning, active in the fight against tuberculosis. Like uncertain diagnosis, the unfound source of an epidemic was to him a confession of medical failing that quickened his quest for knowledge.

Learned above his friends, he had none of the pedant. His lore was deep as well as wide; his mind was a warehouse which he tirelessly stocked to the last. It was no idle, dusty storage loft, but a living treasure vault whose ordering was his pleasure and lasting satisfaction. From it he gained much wisdom; out of it he made his own philosophy and lived it. His self-tested doctrines and the ready resources of his mind were the rod and the staff of his last days and failed him not.

He was at his best and most at ease in the small circle. A charter member of the Springfield Medical Club, for forty-five years he came regularly to its meetings which he enriched with his learning. Elsewhere than in the club's annals he left meager record of the lean, brisk prose and the lithe, quick poetry he could pen so well. Treasured relics of his gravity and mirth, they keep aglow the memory of a rare man, physician, scholar and poet:

WITCH-HAZEL

November's chill and leaden days are here;
The fallen leaves and withered grass proclaim
That winter comes. And yet the yellow flame
Of brave witch-hazel lights the passing year.
Courageous friend! Though bitter storms are near,
Though distant spring seems but an empty name—
Your subtle perfume and your petals shame
Me for my blindness. You, with vision clear,
Beyond the dark and frigid winter see;
And set your fruit prepared against the days
When it shall ripen in the summer sun.
I pray my faith, inspired by you, may be
So keen of eye that through this doubtful haze
I see my life renewed when this life's done.

WALTER H. CHAPIN, *June 6, 1915.*

A. G. R.

DR. WILLIAM MERRITT CONANT*

Dr. William Merritt Conant died suddenly in Boston on February 18, 1937, in his eighty-second year.

He was born in Attleboro, January 5, 1856, the son of Ira M. and Mary F. (Bassett) Conant, and was a direct descendant of Roger Conant, one of the pioneer settlers of Salem. He prepared for college at Adams Academy, Quincy, and was graduated from Harvard College in 1879 and from the Harvard Medical School in 1884. He was surgical house pupil at the Massachusetts General Hospital in 1883 and 1884. On April 17, 1891, he was appointed surgeon to the Out Patient Department of the Massachusetts General Hospital, which position he held until 1900, when he was made visiting surgeon to the South Surgical Service. In 1911 this service was discontinued, and he was transferred to the West Surgical Service until his retirement, February, 1914, when he was appointed to the Board of Consultation. In 1928 he was made honorary surgeon, which position he held until his death.

He also served at various times on the staffs of the Boston Dispensary, St. Elizabeth's Hospital and the Carney Hospital and was consultant at numerous other hospitals throughout New England. From 1890 to 1896 he taught anatomy in the Harvard Medical School, and his private "quiz" classes are well remembered by the men who were students at that period. From 1913 to 1916 he was professor of clinical surgery at the Tufts College Medical School.

Dr. Conant always had an active interest in the training and organization of the nursing profession and was largely instrumental in forming the Nurses' Club of which he was president for twenty-five years.

He was a Founder of the American College of Surgeons and a member of the Boston Surgical Society, the Massachusetts Medical Society, the American Medical Association and the American Society of Anatomists. His social affiliations included membership in the Harvard, Algonquin and the Country clubs.

He was a prominent member of the Episcopal Church and particularly active in the affairs of Emmanuel Church and, later, of St. Paul's Cathedral, where he was president of the Lawrence Men's Club and a prime mover in the Neighborhood Kitchen.

While not an extensive writer, he was a good speaker and a clear and forceful teacher. He was an exceptionally well-grounded anatomist and a skillful and rapid operator. He was one of the most resourceful of the abdominal surgeons of his day and was equal to any emergency. His ability and adaptability were never better shown than when he was faced with some acute surgical condition in a remote farmhouse, operating on the kitchen table by the light of a kerosene lamp, a type of surgery which is practically unknown today. He was physically tireless, and a schedule of six or more major operations, referred to by him as "field day," was a not uncommon occurrence. One of his outstanding achievements was the skill and speed with which he performed a supravaginal hysterectomy.

Perhaps his greatest medical contribution came through his lifelong interest in athletics, especially in football. In 1890 he undertook the training and physical care of the Harvard football team, the first physician to hold such a position in the country. His establishment of a heated shelter for the players between the halves and his prompt handling of acute injuries were immediately widely adopted and were the foundations of the present medical care of athletic teams. He continued to have charge of the Harvard team for several years, and his personal interest in the individual players made him one of the best-known Harvard men of his time. In his later years he became much interested in curl-

*Presented at a meeting of the Boston Surgical Society, April 6.

ing. This interest will be perpetuated by the Conant Cup which was given in his honor and which was put into yearly competition at The Country Club on his eightieth birthday.

By nature he was genial and young at heart, and the esteem and affection in which he was held by the succeeding groups of younger men who came into contact with him, either professionally or socially, is best demonstrated by the fact that he was universally spoken of as "Uncle Bill."

In 1884 he married Mary A. Bennett of Boston, who died in 1936. Two daughters, three sons and a brother survive him.

R. F. O'N.
J. W. C.

REPORTS OF MEETINGS

NEW ENGLAND HEART ASSOCIATION

The monthly clinical meeting of the New England Heart Association was held at the Boston Lying-in Hospital on April 12. Dr. Burton E. Hamilton presided.

The following are abstracts of the papers which were presented:

THE COLD TEST IN DIFFERENTIATING ESSENTIAL HYPERTENSION AND TOXEMIA. By Duncan E. Reid, M.D., and Harold M. Teel, M.D.

The "cold test" as described by Hines and Brown was used in a series of toxemic patients during pregnancy in an attempt to differentiate simple pre-eclampsia, essential hypertension and hypertension associated with chronic glomerulonephritis. Characteristic responses could not be obtained to make the test of value in any given case.

DOES TOXEMIA OF PREGNANCY CAUSE CHRONIC CARDIOVASCULAR DISEASE? By Duncan E. Reid, M.D.

In a preliminary report data were presented of an 8 year follow-up of patients previously normal who developed pre-eclampsia and eclampsia.

The eclamptic group had 21 per cent mild, 3 per cent moderate and 7 per cent severe hypertension. X-ray studies of the heart revealed 14 per cent with definite enlargement and 24 per cent with questionable enlargement. The electrocardiograms showed that 17 per cent had suggestive myocardial disease and 3 per cent definite myocardial disease.

In the pre-eclamptic group the incidence of hypertension was 44 per cent. The x-ray plates of the heart showed 17 per cent with definite and 12 per cent with questionable enlargement.

The higher incidence of hypertension in the pre-eclamptic group raises the question whether certain individuals who are predestined to become hypertensive patients do not reveal hypertension and albuminuria for the first time under the added burden of pregnancy. Such cases do not represent true pre-eclampsia, although they have been classified as such.

FURTHER OBSERVATIONS ON THE PHYSIOLOGY OF THE CIRCULATION IN PREGNANT WOMEN. By K. Jefferson Thomson, M.D.

Observations on pulse rate, velocity of blood flow, venous pressure, vital capacity, viscosity of the blood and the state of the superficial veins in normal pregnant women, which were presented at a meeting of the New England Heart Association one year ago, were reviewed. Observations on the plasma, cell and total blood volumes in normal pregnant women and in pregnant cardiac patients were presented in detail. Data on the cardiac output obtained by Burwell and his associates were presented. A close correlation of the factors which contribute to the circulatory burden in pregnant women was demonstrated. It was emphasized that this burden commences early in pregnancy, increases gradually up to the twentieth week, then rapidly from the twentieth to the thirty-fourth or thirty-sixth week, at which time it becomes maximum, and then diminishes definitely ante partum, a fact hitherto not recognized. Clinical evidence to substantiate these physiologic observations was presented and correlated.

OBSERVATIONS ON LEAD V OF THE ELECTROCARDIOGRAM IN PREGNANT WOMEN. By K. Jefferson Thomson, M.D., and Mandel E. Cohen, M.D.

A study of lead V of the electrocardiogram on 288 pregnant women, of whom 103 were entirely normal, was reported. In this study, lead V was taken with the exploring electrode 5 cm. to the left of the sternum in the fourth interspace, and the indifferent electrode on the left leg. Approximately 10 per cent of all groups (normals, cardiacs, toxemics), excluding patients receiving digitalis, showed an upright T_5. In 15 patients this was found to be present ante partum and to disappear post partum. Data from simultaneous x-ray studies of the heart, lungs and diaphragm were presented which suggested that the electrocardiographic changes were probably a result of altered intrathoracic relation. The effect of respiration on the amplitude and configuration of various components of the electrocardiographic complexes in lead V was emphasized, since in some patients changes suggestive of myocardial disease were produced by forced inspiration. Further support was given to the accumulating evidence that certain changes in lead V, particularly upright T-waves, are in themselves not indicative of myocardial disease.

MALIGNANT ENDOCARDITIS IN PREGNANCY. A CASE REPORT WITH SPECIMEN. By Hugh H. Nuckols, M.D., and Arthur T. Hertig, M.D.

The only case of acute bacterial endocarditis occurring among 850 cardiacs delivered in the Boston Lying-in Hospital was reported in some detail. The interesting features of the case, aside from its rarity, were that the vegetations were superimposed on areas of rheumatic endocarditis, that the cardiac murmurs remained unchanged throughout the course

of the disease and that the primary focus of the invading organism (a beta hemolytic streptococcus) appeared to have been the parametrial tissues in a patient delivered by classical cesarean section.

CAUSES OF MATERNAL MORTALITY IN PREGNANT WOMEN WITH HEART DISEASE. By Burton E. Hamilton, M.D.

The causes of maternal mortality in pregnant women with heart disease can be divided into two groups:

(1) Deaths due to congestive heart failure. Nearly all these deaths are avoidable by health examinations and classification of cardiacs before pregnancy; by regular supervision of those with significant heart damage; and by special management throughout pregnancy.

(2) Deaths due to subacute bacterial endocarditis, pulmonary embolism, or the complications of pregnancy. These altogether cause an unavoidable maternal death rate of approximately 2.5 per cent.

SPECIAL LECTURES IN ENDOCRINOLOGY

Dr. George van S. Smith presented a lecture on "Female Sex Hormones in Nonpregnant Women" at the Harvard Medical School, March 2. As a preliminary, Dr. Smith summarized the terms applied to the various hormones related to female sex physiology:

A.P.L.—Anterior pituitary-like hormone (prolan), placental in origin;

F.S.H.—Follicle stimulating hormone (prolan A), anterior pituitary in origin;

L.H.—Luteinizing hormone (prolan B), anterior pituitary in origin;

Estrogenic substance—Estrin;

Estrin—{Estrone—theelin, ketohydroxyestrin / Estriol—theelol, trihydroxyestrin} both in urine;

Estradiol—Dihydrotheelin or dihydroestrin, ? ovarian origin;

Progestin—Extract of corpus luteum, corpus luteum hormone;

Progesterone—Synthetic progestin.

Dr. Smith described experimental work performed on rabbits which indicated that the administration of progestin led to an increase in the amount of estrin recovered from the urine, and which suggested that a periodic increase of estrin in the urine of women might indicate the presence of a corpus luteum and, therefore, be presumptive evidence for the occurrence of ovulation. Subsequent investigations showed that, when 200 to 400 rat units of estrin were fed to women daily during the menstrual cycle, there was an increased excretion of estrin during the periods when corpus luteum activity would be expected.

The previously cited experiments, although suggestive, were quantitatively inaccurate and pointed to the necessity for better methods of analyzing urine for estrin.

Dr. Smith then outlined the investigation into various methods of treating and extracting urine for estrin. It developed that acid hydrolysis followed by extraction with benzene gave not only much higher assays than could be acquired by any other method tried but also quantitative recovery of estrone or estriol added to urine. Moreover, the use of this method resulted in the consistent finding of a typical curve of urinary estrin during normal ovulatory menstrual cycles, with a peak at the time of the maturity of the corpus luteum and a low level at the onset of menstruation. A failure to find the intermenstrual peak of urinary estrin would indicate a failure of normal ovulation and corpus luteum formation.

There being no evidence for a renal threshold for estrin, and some evidence against it, it may be assumed that the amounts of estrin in the urine represent the balance between production and destruction, and that progestin increases the amount excreted probably by diminishing its destruction within the body.

Although these typical curves support the idea of estrin withdrawal as the precipitating factor of endometrial bleeding, the analyses of specimens of urine throughout what appeared to be anovulatory cycles, that is, cycles in which the intermenstrual peak was lacking, demonstrated that flowing could occur in spite of, and possibly because of, a rise in estrin, since in these curves the highest values were found at the onset of menstruation. These findings suggest that all bleeding may be fundamentally estrogenic, that is, the result of a certain degree of endometrial proliferation in the absence of any menstrual inhibitor, such as progestin. In the ovulatory cycle, estrin is high at the time of ovulation, but bleeding is prevented by the developing corpus luteum, upon the regression of which menstruation ensues. In the anovulatory cycle, no corpus luteum being present, the endometrium bleeds as soon as a certain threshold of proliferation is reached.

Analyses of the urine of nonpregnant women for the gonadotropic factors have been handicapped by the inadequacy of the existing methods. The only consistent finding has been a positive excretion of F.S.H. just before the onset of flow, whether or not the flow was preceded by a normal ovulatory cycle. Inasmuch as experimental bleeding may be produced in hypophysectomized monkeys, this finding cannot be interpreted as evidence for pituitary involvement in the bleeding mechanism. Markee has shown that both ovulatory and anovulatory flow in monkeys are preceded by arteriolar spasm, and it is possible that this phenomenon is followed by the release of pituitary activity with a consequent appearance of F.S.H. in the urine coincident with the onset of flow. The fact that high F.S.H. values and the release of arteriolar spasm are associated with both ovulatory and anovulatory menstruation implies that the same mechanism is involved in both types of bleeding.

Dr. Smith emphasized that the findings reported could not be considered final, since methods of analyzing urine for female sex hormones were still in the process of investigation. The uniformity of the results in certain respects, however, indicates that they may give some clues to the physiologic background of the ovarian cycle and menstruation in women.

NORFOLK DISTRICT MEDICAL SOCIETY

The following are abstracts of papers read before the meeting of the Norfolk District Medical Society held January 19, at the Peter Bent Brigham Hospital, Dr. Maurice Gerstein, president of the society, presiding:

Demonstration of an Interesting Patient:
By Maurice A. Schnitker, M.D.

This patient is 59 years old and entered the hospital 2 weeks ago with a history of continued excess in alcoholic indulgence. For almost 10 years the patient has noticed some shortness of breath. About 2 months previous to admission this condition grew worse, particularly at night when it was accompanied by considerable coughing. At about the same time he noted swelling of the feet and lower legs, which increased. He noted also that his abdomen seemed larger.

On admission, physical examination showed obesity, moderate dyspnea, and a red, slightly cyanotic facies. There was moderate tachycardia with moderate hypertension, brawny, pitting edema of the legs, and some distention of the abdomen, with shifting dulness in the flanks and a fluid wave. The patient also had cardiac hypertrophy with a systolic murmur and occasional extrasystoles, retinal vascular changes and an enlarged and tender liver. Laboratory studies showed a concentrated urine containing bile and occasional casts; the renal function was normal for phenolsulphonphthalein excretion and nitrogen retention; and the gastric juice contained free hydrochloric acid. Examination of the blood showed a hyperchromic, macrocytic anemia. The icteric index of the blood serum was moderately increased, and the blood Wassermann and Hinton tests were negative.

The patient was sent into the hospital as a case of cirrhosis of the liver. Treatment with bed rest and digitalis produced a slowing of the pulse, considerable diuresis with decrease in body weight, improvement in the dyspnea and loss of edema. He had symptoms and signs indicative of cardiac decompensation. The results of therapy show that the bulk of his symptoms were due to cardiac insufficiency, and that he has chronic nonvalvular heart disease with hypertension. However, he has an enlarged liver, an alcoholic history and bile present in the blood serum and urine, which point to a diffuse intrahepatic lesion of the nature of a cirrhosis.

How is one to explain his anemia? There is no history of blood loss, and the anemia is hyperchromic; it is also macrocytic. The gastric juice shows free hydrochloric acid. Therefore, the anemia, though consistent in form with pernicious anemia, is not to be diagnosed as such. It is not an anemia from neoplasm with bone metastases, so far as the present evidence goes. It is not an anemia from nephritis because the renal function is unimpaired. It most probably is a case of hyperchromic, macrocytic anemia from diffuse liver disease. Such anemias occur. Liver therapy may greatly improve the anemia, as it would if it were a case of pernicious anemia; but the improvement will not persist if the liver lesion is the cause of the condition.

To summarize, this patient has symptomatic, chronic, cardiac nonvalvular disease with hypertension, and asymptomatic diffuse liver disease, a type of cirrhosis of the liver.

Adhesive Pericarditis: Some Clinical and Laboratory Aspects of Its Problems:
By C. Sidney Burwell, M.D.

Constrictive pericarditis is a term applied to the condition which results when fibrous thickening of the pericardium interferes mechanically with the normal movements of the heart and blood. This is a disorder of the circulation, which is marked by striking and long-standing venous engorgement, enlargement of the liver, ascites, weakness and, sometimes, edema. The heart is not greatly enlarged, valvular disease is absent, and the blood pressure is not elevated. The pulsations of the heart under the fluoroscope are reduced or absent; the pulse pressure is low and pulsus paradoxus is present. These symptoms are mainly due to high venous pressure and low cardiac output per beat. At autopsy or at surgical exploration, the pericardium is found to be replaced by a thick and inextensible capsule of fibrous tissue. Removal of a sufficient portion of this fibrous envelope results in relief of the symptoms and signs and, in a gratifying number of cases, in a return to health.

Toxic Goiter:
By Elliott C. Cutler, M.D.

Toxic goiter was chosen as our subject because it is a common disease, constituting 3 per cent of the admissions to this hospital in the last 5 years. The function of the thyroid gland is to regulate internal combustion, and it may play a role in growth and differentiation. The effect of its secretion can best be appreciated by a study of endemic goiter. In the acinar tissue of the patient who receives sufficient iodine in his drinking water and food, we find colloid filling the round lumen of the follicles. In districts where iodine is wanting, the patients have difficulty in elaborating sufficient thyroxin; therefore, the gland hypertrophies, and we find the cells of the follicles forming finger-like projections into the lumen of the follicle. In adolescents and in pregnant women who live in endemic goiter regions, the thyroid gland hypertrophies because under these circumstances more thyroxin is necessary for the additional physiologic burdens. In such instances,

the histologic appearance of the gland is of little assistance to the clinician because, when iodine is fed to the patient, the gland again assumes its normal appearance under the microscope. Thus, the pathologist cannot properly interpret the histologic appearance without a knowledge of the amount and time of iodine therapy.

When we progress to the toxic thyroid conditions, we note that hypertrophy of the acinar epithelium usually occurs in proportion to the signs and symptoms of thyroid intoxication. Here again, when the patient is fed iodine, the hypertrophic condition may be made to involute, and, coincident with this change, the signs and symptoms of thyroid intoxication diminish. The symptoms of hyperthyroidism may be grouped under two divisions: (1) circulatory effects, such as tachycardia and palpitation, which are, perhaps, produced by stimulation of the accelerator apparatus, and (2) effects on the nervous system, as indicated by irritability, easy fatigue, sweating, tremors and dilated pupils. The use of iodine has made the surgery of the thyroid safe and has led to great advances in our appreciation of thyroid activity. By its use the symptoms and signs due to oversecretion can be diminished, and the patient is made a safe surgical risk.

Five patients who had been treated surgically for thyroid conditions were presented:

Case 1. A young white girl of 20 came to the hospital complaining of nervousness and *unilateral exophthalmos.* Her pulse was 120, and her basal metabolic rate was plus 5. After thyroidectomy it dropped to minus 5, with great improvement in the subjective symptoms and partial recession of the exophthalmos.

Case 2. A white man of 56 had had a subtotal thyroidectomy for typical Graves's disease. After the thyroidectomy, the basal metabolic rate was reduced to normal, and the circulatory and nervous symptoms disappeared, but the exophthalmos progressed until the lids could not be closed, and loss of vision was threatened. Craniotomy was then performed, the roofs of both orbits removed, and recession of the *malignant exophthalmos* occurred.

Case 3. A white woman of 42 presented the typical picture of cardiac decompensation of 9 years' duration. There was auricular fibrillation, dyspnea and peripheral edema. *Thyroid heart* is frequently associated with toxic adenoma. After a total thyroidectomy, her weight increased from 78 pounds to 118 pounds. Fibrillation ceased, the edema disappeared, and activity was resumed. The basal metabolic rate was held at minus 15 by the daily ingestion of 0.015 gm. of Armour's thyroid extract. It may be true that this dried extract does not fully replace the natural thyroid secretion, but patients using it demonstrate that, so far as can be determined, they are normal.

Case 4. A colored man of 52 entered the hospital with all the symptoms and signs of *failing hypertensive heart disease* in its most acute phase. After a long period of medical treatment without improvement, a total thyroidectomy was done (August, 1933). The patient is now ambulatory, cheerful and able to do light work. His edema and ascites have disappeared, and his basal metabolic rate is minus 15. This patient demonstrates the value of thyroidectomy in diminishing the load demanded of a crippled heart. Apparently desiccated thyroid extract maintains such persons at a fairly normal level.

Case 5. A white male of 54 entered the hospital in 1930 with a typical Graves's disease syndrome. Subtotal thyroidectomy gave relief, but within 2 years there was a *recurrence* of the symptoms. Again surgery was tried, and removal of the remaining thyroid tissue gave clinical improvement. Four years later, however, his basal metabolic rate had again reached plus 27. He was given x-ray therapy and iodine treatment, and there was gradual improvement. It is in patients with recurrence that we hope to find the true cause of Graves's disease, but, thus far, though such patients are not infrequently encountered, since from 5 to 10 per cent of patients surgically treated have recurrences, no clue has been found to the initial factors that stimulate the thyroid gland.

Conclusions: The demonstration of such a variety of cases as is shown here emphasizes the possible role of the thyroid in patients with disturbances of the circulatory system. The circulatory symptoms in Graves's disease may be only tachycardia, dyspnea and palpitation; in the thyrocardiac patient, frank fibrillation is common; in patients with cardiac decompensation, total thyroidectomy brings relief by putting less demand upon the crippled heart; and even in patients with simple endemic goiter and normal basal metabolic rate, thyroidectomy has been shown to do away with minor cardiac irregularities.

Contributions from the Department of Roentgenology:

By Merrill C. Sosman, M.D.

Each patient shown represents a group of similar cases, and the three groups represent some of the radiosensitive tumors that are seen. The first 2 patients present a form of myeloma which is fairly benign, so far as life expectancy is concerned, and which is quite radiosensitive.

Case 1. A 49 year old Greek male, who has had recurrent attacks of tonsillitis, entered the hospital in 1928 with a defect in his right parietal bone. There was generalized lymphadenopathy. Biopsies from the cervical nodes indicated a tumor of the malignant lymphoma group, called "atypical Hodgkin's disease." Under radiation treatment, the defect in the skull gradually healed. In the past 9 years there have been multiple lesions in various bones, the scapulae, mandible, ribs, vertebrae and pelvis particularly. Each lesion has been associated with localized pain and, in each case, has responded very promptly and well to small doses of x-rays. The patient is presented tonight alive and well, 9 years after the discovery of his disease.

Case 2. A 79 year old male came to the hospital

in March, 1931, because of a pathologic fracture of the radius. Complete x-ray examination revealed multiple lesions mostly at the ends of his long bones, but also involving the skull. A biopsy of one of these lesions revealed a myeloma, which Dr. Wolbach has classified as a plasmocytoma. His lesions have also responded promptly and well to x-ray treatment.

This group of tumors, plasmocytomas, is characterized by multiplicity of lesions in the bones, prompt symptomatic response to x-ray treatment and a relatively benign course. In x-ray films the individual lesions in the bones have an appearance very much like that of benign giant cell tumors, expanding the ends of the long bones with multiple trabeculae through or around them, usually involving the epiphyseal portions and usually having only a few of the small punched-out lesions commonly seen in the rapidly fatal and more common form of multiple myeloma. Such patients have not shown Bence-Jones's protein in the urine and the blood calcium and phosphorus studies have been normal.

Case 3. The next patient, a young male, who is too ill to be shown, is typical of the next group—embryoma of the testicle. He has had a lump on his testicle for 6 months, which has grown rapidly in size, and he was admitted several days ago complaining of weakness, loss of weight and severe headaches. X-ray examination revealed multiple large tumor deposits in his lungs, and, from his symptoms and signs, he also has intracranial metastases. We are trying radiotherapy, but he may be too far gone to be helped. (Dr. Sosman then demonstrated the films of a similar patient who had extensive metastases which disappeared entirely under x-ray treatment. This patient is alive and well 7 years after the metastases were demonstrated.)

The point here is that some of these embryomas of the testicles are extremely sensitive to x-ray treatment and may even be cured in the strict clinical sense of the word. Most of them show a positive pregnancy test in the urine, and one can make a diagnosis of recurrence or of metastases if the Aschheim-Zondek test becomes positive after the removal of the testicular tumor.

Case 4. The final case is representative of a group of 80 similar ones which have seen here, most of them on Dr. Cushing's service. This boy is now 17 years old, a high school student, and first came to our hospital in 1931 with headaches, failing vision and vomiting—the classical triad indicating increased intracranial pressure. Dr. Cushing demonstrated a cerebellar medulloblastoma at operation, and at intervals ever since the patient has been receiving x-ray treatments. This type of tumor is the most sensitive to x-ray treatment of all of the brain tumors, and we are now recommending x-ray treatment alone in preference to surgery. The treatment must be given not only to the cerebellum but also to the entire cerebrospinal pathway, as the tumors are very prone to transplant themselves down the spinal cord or forward into the ventricles or over the lateral hemispheres. The boy was admitted this time because of pain in his back, numbness and tingling in his legs and incontinence of urine. These symptoms were made very much worse after x-ray treatment to his spine, but in 2 more days they had completely disappeared, and the patient is now perfectly normal, so far as we can determine.

Our longest period of survival in this group is 9 years, and that particular boy has been free of symptoms for 5 years.

In summary I will say that these cases which I have presented tonight are unfortunately in the minority, but they do prove that x-ray therapy may be of extreme benefit to patients who harbor radiosensitive tumors.

Diuretics:
By Marshall N. Fulton. M.D.

The courses of 4 patients were studied, 3 of whom suffered from cardiac failure with circulatory edema. It was concluded that diuretics are often wrongly given in the early phases of treating cardiac decompensation, when the resulting diuresis may prove very exhausting. Drugs inducing diuresis cause a great loss of chloride so that a patient suffers not only from loss of water, but also from loss of electrolytes and a disturbed acid-base balance may occur. One should wait 3 or 4 days to see if digitalis itself will cause diuresis before diuretic drugs are given.

One patient who could not get sufficient diuresis to reduce her edema at home reacted very well at the hospital when given mercupurin intravenously in combination with ammonium chloride by mouth. That patients respond differently to different diuretics was illustrated. There is no advantage in using mercupurin suppositories in the hospital where intravenous injection can be given. It was stated that the mercurial diuretics now in common use can be given repeatedly to most patients over a long period of time with no harmful effects.

Some Surgical Aspects of Peptic Ulcer:
By Robert Zollinger, M.D.

The indications for surgery in peptic ulcer have been fairly well established. Outside of immediate surgery for perforation, a careful medical regime with confirmation by x-ray studies is usually advisable before surgical therapy is considered. However, there is one type of lesion, namely, the prepyloric ulcer, which at all times must be considered a potential surgical lesion because of the possibility of malignancy. It has been emphasized that any chronic lesion, demonstrable by x-ray in the prepyloric region, that is, in the distal few centimeters of stomach, exclusive of the pyloric sphincter, has a greater chance of being malignant than benign, and, therefore, surgery is advisable in such cases. Three patients, ranging from 31 to 64 years of age, with prepyloric ulcers which at operation proved to be malignant, were demonstrated.

Case 1. A retired salesman of 63 years, who had developed an advanced degree of silicosis when working as a stove moulder, was shown. Because of the accidental finding of a positive blood reaction in the stools during a routine examination, a gastrointestinal series was done. A crater, 3 centimeters in length, was found in the prepyloric region. A Billroth I type of resection of the pylorus was performed, with removal of about one half of the stomach. This case was an example of a very silent prepyloric lesion, which was accidentally discovered and which proved to be carcinoma.

Case 2. A retired truck driver, of about 64 years, had suffered from what were apparently attacks of angina pectoris. Later these attacks were not relieved by nitroglycerin. Because of the change in the type and location of the patient's complaint, a gastrointestinal series was done, which showed a small prepyloric crater on the lesser curvature side. After 3 weeks of careful medical treatment, the patient was symptomatically relieved, and the crater decreased in size. His symptoms returned 1 month later, and a repeat gastrointestinal series showed that the crater had increased in size. A neoplasm was removed from the posterior wall of the stomach, adjacent to the pyloric sphincter. This case illustrates the necessity of frequent observation and x-ray examination, despite the fact that the crater may appear at first to respond to medical treatment.

Case 3. A 31 year old man was shown because of evidence of metastases following resection of a carcinoma in the prepyloric region 3½ years previously. At the age of 27, following symptoms of 6 months' duration, a prepyloric ulcer was found. Gastric analysis showed a free acid as high as 76 and a total acid as high as 100. Despite clinical improvement on a Sippy regime, repeated x-rays showed an increase in the size of the crater, and resection was carried out. This patient illustrates the seriousness of a prepyloric ulcer, even in younger persons, despite high values by gastric analyses.

A patient with a prepyloric ulcer should always be considered a candidate for surgical treatment despite temporary symptomatic and x-ray signs of improvement.

NOTICES

SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the headquarters of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, May 18, at 12 noon.

The speaker will be Roy F. Feemster, M.D., assistant director, Massachusetts State Antitoxin Laboratory; instructor in applied immunology, Harvard School of Public Health and Harvard Medical School. His subject will be "The Present Status of Biological Agents."

All physicians are cordially invited to attend.

JOHN B. HALL, M.D., *Secretary.*

THE BOSTON DISPENSARY

CLINICAL STAFF MEETING

A luncheon meeting of the clinical staff of the Boston Dispensary, 25 Bennet Street, will be held on Wednesday, May 12, in the auditorium on the second floor of the Dispensary building, at 12 o'clock noon.

At 12:30 p. m., Dr. A. Warren Stearns, physician-in-chief of the Department of Nerve and Mental Diseases, will talk on the subject, "Medicine in Boston During the Revolutionary War Period." (Illustrated.)

An invitation is extended to any who are interested in the subject. Luncheon to nonmembers, 35c.

OLIVER G. TINKHAM, M.D., *President,*
ALLEN R. BARROW, M.D., *Secretary.*

NEW ENGLAND HEART ASSOCIATION

The next meeting of the New England Heart Association will be held at the Evans Memorial, Massachusetts Memorial Hospitals, Boston, Monday, May 10 at 8:15 p. m.

PROGRAM

1. The Reaction of the Heart During Work; Cardiopulmonary Function Tests.—Gustav Nylin, M.D., associate professor of medicine, Royal Caroline Institute, Stockholm.
2. An Attempt to Treat a Case of Subacute Bacterial Endocarditis by Surgery.—Ashton Graybiel, M.D., and John W. Strieder, M.D.
3. A Possible Instance of Paroxysmal Auricular Fibrillation of Cerebral Origin.—Norman Boyer, M.D.
4. The Multiple Stethoscope: Is It a Useful Implement for the Clinical Teaching of Heart Disease?—Reginald Fitz, M.D.
5. On the Management of Obesity in Relation to the Treatment of Heart Disease.—Ben Vidgoff, M.D.
6. An Unusual Case of Thoracic Aneurysm.—Harry Parks, M.D.

All members of the New England Heart Association and interested physicians are invited to attend.

JAMES M. FAULKNER, M.D., *Secretary.*

CUTTER LECTURE ON PREVENTIVE MEDICINE

The Cutter Lecture on Preventive Medicine will be given by Dr. Thorvald Madsen, head of the State Serum Institute at Copenhagen and chairman of the Health Committee of the League of Nations, on "The Control of Syphilis in the Scandinavian Countries" in the amphitheater of Building E, the Harvard Medical School, on Friday, May 14, at 5:00 p. m.

Anyone interested is cordially invited to attend.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 10

Monday, May 10—

*8 p. m. Lecture on alcoholism, Dr. Jackson Thomas, in the amphitheater of the Mallory Institute of Pathology, 784 Massachusetts Avenue, Boston.

*8:15 p. m. New England Heart Association. Evans Memorial, Massachusetts Memorial Hospitals, Boston.

Tuesday, May 11—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Dizziness from the Aural Standpoint. Dr. Philip E. Meltzer.
9:30 a. m. Massachusetts General Hospital. Neuro-Psychiatric Conference.

Wednesday, May 12—

8 a. m. Massachusetts General Hospital. Grand rounds. Orthopedic department.
*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Hospital case presentation. Dr. S. J. Thannhauser.
12 m. Boston City Hospital Conference on Clinical Pathology.
†12 m. Clinicopathological conference. Children's Hospital amphitheater.
*12 m. The Boston Dispensary, Clinical Staff Meeting.
4 p. m. - 5 p. m. Surgical pathological conference. Dr. Cutler and Dr. Wolbach, Peter Bent Brigham Hospital.

Thursday, May 13—

9 a. m. Massachusetts General Hospital. Surgical grand rounds.
*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Class Method of Treatment of Hypertension. Dr. Robert W. Buck.
9:15 a. m. Massachusetts General Hospital. Neurological conference. Ether Dome.
12 m. Massachusetts General Hospital. Clinicopathological conference.

Friday, May 14—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Mind and Matter or the Psyche and the Heart. Dr. Paul D. White.
10 a. m. Massachusetts General Hospital. Fracture rounds.
12 m. Massachusetts General Hospital. Clinical meeting of the staff of the Children's Medical Service. Ether Dome.
5 p. m. Cutter Lecture on Preventive Medicine. Harvard Medical School, Building E.

Saturday, May 15—

*9 a. m. - 10 a. m. Boston Dispensary, 25 Bennet Street, Boston. Hospital case presentation. Dr. S. J. Thannhauser.
*10 a. m. - 12 m. Staff rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

May 6—Faulkner Hospital Clinical Meeting. 5 p. m.
May 7—Boston Society for the Advancement of Gastroenterology. Page 678, issue of April 15.
May 10—New England Heart Association. Page 816.
May 12—The Boston Dispensary, Clinical Staff Meeting. Page 816.
May 12—National Hospital Day.
May 12—Boston City Hospital. Conference on Clinical Pathology. Page 816.
May 13—Pentucket Association of Physicians. Hotel Bartlett, 95 Main Street, Haverhill, at 8:30 p. m.
May 14—Cutter Lecture on Preventive Medicine. Page 816.
May 18—South End Medical Club. Page 816.
June 1, 2 and 3—Annual meeting, Massachusetts Medical Society, Hotel Bradford, Boston.
June 7—American Medical Golfers Play in Atlantic City. Page 582, issue of April 1.
June 7 and 8—American Heart Association. Page 769, issue of April 29.
June 7-11—American Medical Association. Atlantic City. Page 709, issue of April 22.
June 8—The American Neisserian Medical Society. Page 489, issue of March 18.
June 8 and 9—American Board of Obstetrics and Gynecology. Page 78, issue of January 14.
June 11-18—Catholic Hospital Association. Page 488, issue of March 18.
July 6-11—Fifth International Congress of Hospitals. Page 37, issue of January 7.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

May 12—Annual meeting. Salem Country Club. Speaker: Dr. P. P. Johnson of Beverly. Subject: A Trip to the Bahamas and Guatemala. (Illustrated.)

R. E. STONE, M.D., Secretary.
74 Lothrop Street, Beverly.

FRANKLIN DISTRICT MEDICAL SOCIETY

Will meet at the Weldon in Greenfield at 11 a. m. the second Tuesday of May.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

HAMPDEN DISTRICT MEDICAL SOCIETY

May 6—Censors' meeting. 20 Maple Street, Springfield. 4 p. m.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

May 12—Bear Hill Golf Club, Stoneham.

KENNETH L. MACLACHLAN, M.D., Secretary.
1 Bellevue Avenue, Melrose.

NORFOLK DISTRICT MEDICAL SOCIETY

May—Annual meeting.
May 6—Censors' meeting.

FRANK S. CRUICKSHANK, M.D., Secretary.
1247 Beacon Street, Brookline.

PLYMOUTH DISTRICT MEDICAL SOCIETY

May 20—11 a. m. Lakeville State Sanatorium.

FRED F. WEINER, M.D., Secretary.
231 Main Street, Brockton.

WORCESTER DISTRICT MEDICAL SOCIETY

May 6—At 4:30 in the rooms of the Worcester Medical Library, Inc., at 34 Elm Street, Worcester, will be held the spring meeting of the Board of Censors.
Wednesday Afternoon and Evening, May 12—Annual meeting.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.

BOOK REVIEWS

Plastic Surgery of the Nose. J. Eastman Sheehan. Second Edition, Entirely Rewritten. 186 pp. New York: Paul B. Hoeber, Inc. $9.00.

This book is divided into six chapters and is written in a clear and concise manner. The first chapter deals with the important anatomic points in relation to reparative surgery of the nose. This is followed by two chapters on detailed description of various types of nasal deformities of minor character, and operative procedures for the correction of such deformities. These two chapters, which are probably the most thorough and interesting part of the book, contain many instructive ideas. Chapters IV and V give the major deformities characterized by loss of tissue, but the subject is covered rather briefly and is incomplete. The final chapter is on precautions, preparation and postoperative care.

This is the second edition of Dr. Sheehan's book on plastic surgery of the nose. The first was published several years ago. It is, on the whole, the expression of the author's method of approach in deformities of the nose. It is to be regretted that he has not seen fit to mention any bibliographical references, which would give students facilities for increasing their knowledge.

Textbook of General Surgery. Warren H. Cole and Robert Elman. 1031 pp. New York and London: D. Appleton-Century Company. $10.00.

The reviewer has had this volume in his possession for some time. During this time his interest has been so held that he has read it (a text of 994 pages) nearly from cover to cover. The information given in the chapters on Neoplasms and Cysts (53 pages), The Breast (23 pages), Surgical Diseases of the Chest (65 pages), The Endocrine Glands (45 pages) and Gynecology (40 pages), comprising less

than one-fifth of the work, is more than worth the price of the entire volume.

The reviewer is impressed with the number of references to recent literature. Taking at random the bibliography of thirteen of the thirty chapters, he finds that two-thirds are references to literature published in the last 5 years (1932-36) and 25 per cent more to literature of the previous 5-year period.

Although the authors modestly apologize for publishing another work on general surgery, it would have been a pity if this volume had not been written. It is dedicated to Evarts Ambrose Graham, their "teacher, chief and friend," who writes the foreword.

Although the work is built up around lectures delivered to third-year students at Washington University, St. Louis, with additional material for fourth-year students, it merits a place on the shelves of every practicing surgeon. It is the most informative and up-to-the-minute of any of the single volumes on general surgery which the reviewer has examined for several years. Surgical readers need not be reminded that Washington University, St. Louis, is the birthplace of the "Year Book of General Surgery," a storehouse of recent important surgical literature.

The 559 figures in the text are carefully selected. In a number of instances a single figure will comprise a clinical photograph, x-ray reproduction and photomicrograph. There is a five-page three-column index of authors and an excellent thirty-page double-column subject index. The physical make-up of the book is a credit to the publishers.

Oeuvres Médicales d'Alexandre de Tralles. F. Brunet. 3 vol. 809 pp. Paris: Paul Geuthner, 1933-36. Fr. f. 162.

Alexander of Tralles (525-605) was, in many respects, the greatest of the Byzantine compilers of medical thought of his time, for he not only rewrote the existing literature but also added some original observations of his own. In his works are found descriptions of insanity, gout, dysentery and phthisis. He was the first to write extensively on parasitology, particularly on diseases due to intestinal worms.

Alexander's writings exist in a series of Greek manuscripts at the Bibliothèque Nationale in Paris, which Brunet has used as the basis of his French translation. In addition, there is the printed edition of Alexander's works, published in Lyons in 1504, in Latin, and a German translation issued by Puschmann in Vienna, 1878-9, in two volumes. Brunet has used the German edition in coordinating his notes, but his translation is fresh from the Greek manuscripts mentioned above, particularly one which he intends to reproduce in photogravure as a fourth and final volume of his present series.

The chief value of this work lies in the excellent bibliography of Alexander of Tralles and a survey of medicine in the sixth century, during which Alexander lived. Secondly, there are complete translations of his works, covering the last two volumes, a product of twenty-five years of intensive labor on the part of the author.

Cataract. Its Preventive and Medical Treatment for Specialists, General Practitioners and Students. A. Edward Davis. 161 pp. Philadelphia: F. A. Davis Company, 1937. $3.00.

Enclosed by an imperforate membrane, its lens capsule, the crystalline lens is unable to shed any of its fibers elaborated by the epithelial cells. By osmosis through this membrane, the cells and fibers of the lens derive oxygen and nutrition, and eliminate waste products.

Opacification of lens structures, known as cataract, is ascribed on a theoretical basis to physical or chemical causes which alter the permeability of the lens capsule or affect adversely its internal oxidation mechanism. Avitaminosis has been urged as one of the many potential causes of cataract. No one has ever established the exact chemical reaction attending cataract formation, or the reversibility or irreversibility of this reaction.

Admitting the empiricism of his methods, the author claims to be able to restrain cataract formation so sufficiently that three quarters of his patients avoid the surgeon's knife. Although he states that his treatment is efficacious for "subcapsular and postcortical cataracts in their incipiency," the author does not disclose how he discriminates between senile cortical blemishes, which over a long period of years seldom progress, and the incipient cataracts, which progress slowly or quickly to mature cataracts. His treatment consists of general hygiene attained through freeing the patient from focal infection and metabolic disorder, of regulation of the diet, and of semiweekly subcutaneous injections of lens antigen in increasing amounts, combined with the use of potassium by mouth and a 2 per cent solution of dionin in the affected eye every other night.

Effective arrest or prevention of cataract awaits an exact knowledge of its cause or causes.

Children Handicapped by Cerebral Palsy. Psychological Factors in Management. Elizabeth Evans Lord. A Medical Explanation by Bronson Crothers. 105 pp. New York: The Commonwealth Fund, 1937. $1.25.

This book should prove instructive not only to the parents of children with cerebral palsy but to teachers and physicians as well. The chapter by Dr. Crothers gives, in a clear and concise manner, the types of injury that may occur to the brain, the procedures necessary in establishing the diagnosis, and the difficulties that are encountered when one attempts to make a final appraisal of the motor, emotional and educational status of the child. Dr. Lord illustrates the importance of supervised muscle exercise, so-called "muscle training," but at the same time sets forth its limitations. The latter is equally important, for not infrequently the parents of these

children make great sacrifices in order to have the child receive treatment over a long period of time, which in many instances proves of little benefit. The significance of mental tests and their application to these patients are discussed in a most practical manner, as Dr. Lord has defined the limits of any one method and has shown that a combination of these procedures must be employed if one is to determine properly the educational possibilities of the patient. Her practical attitude toward these measures is shown in the following quotation, "Although mental tests have a scientific value aside from the immediate practical use, it has been our purpose in this study to stress their clinical value. They have clinical value in so far as they present an objective analysis of the mental condition, which by its clarity will reduce the conflict of opinion and give a sound and convincing basis for education plans." The emotional relation between the teacher, parent and child receives its just attention, and the importance of not overestimating the patient's mental ability is stressed, for, if this mistake is made, the situation may become unbearable to all parties concerned. The real problem lies not only in being able to evaluate the mental and physical endowment of the individual and, with this as a basis, to anticipate the educational plan, but also in exercising care that the duties imposed upon the child will not prove to be a burden in later life. Dr. Lord also introduces the pertinent question as to the station of these people in adult life, for at the present time positions for them are singularly absent—a situation that forces many of these individuals to desperate measures.

Modern Urology. In original contributions by American authors. Volumes I and II. Edited by Hugh Cabot. Third Edition, Thoroughly Revised. 1813 pp. Philadelphia: Lea & Febiger. $20.00 for both volumes.

It is our opinion that it is as difficult for one individual to write a complete textbook of any of the branches of medicine or surgery as it is to have complete mastery of so large a subject. Authors, then, have depended upon the writings of others, in large part, to present their subject in entirety. But since the labors of others have been put into the words of the writer of the text, such works are essentially translations. As a rule, the original text suffers by translation. Dr. Cabot, on the other hand, has made no such attempt. "Modern Urology" is written by thirty-five contributors carefully chosen by the editor as best qualified to give opinions on the various phases of urology. The result is a textbook with a fresh and clear point of view that completely fails to carry on certain of the shopworn superstitions which become near-facts only because of their repetition from one book to another. Neither has Dr. Cabot fallen into an easy pitfall of permitting any contributor to ride a favorite horse too far and thereby unbalance his book.

Each chapter gives the reader a complete and very much up-to-date survey of its subject based on original work and original observation.

We are of the opinion that one virtue a textbook may have is that it shall be read. "Modern Urology" is one of the most readable textbooks we have seen. The subject-matter flows at an even pace and is not cut up into small subdivisions which may give meaty facts, but lack seasoning. Dr. Cabot's own interpolations in the various chapters are among the book's pleasantest and most readable features, and we wish there were more of them.

It is evident that we are enthusiastic about "Modern Urology." We recommend it to any who are interested in the subject, student or practicing physician, and we wish to congratulate Dr. Cabot.

The Extra Pharmacopoeia. Martindale. Published by the direction of the Council of the Pharmaceutical Society of Great Britain. Twenty-First Edition. Volume 1. 1182 pp. London: The Pharmaceutical Press, 1936. Twenty-seven shillings and sixpence.

This booklet corresponds in part to our "New and Non-Official Remedies," but combines also something of our "National Formulary." It is published by direction of the Council of the Pharmaceutical Society of Great Britain under the guidance of a committee of pharmacists and physicians.

It is primarily of value to the pharmacist — although it contains a great deal of information of value to the physician. In addition to the usual chemical information, many therapeutic facts are added. A valuable feature is exact references to the literature in support of the statements made.

While this booklet is not necessary for the physician's library, it is a useful work of reference. It should be remembered when information as to remedies is sought.

Administrative Psychiatry. William A. Bryan. 349 pp. New York: W. W. Norton & Company, Inc. $3.50.

A book on mental hospital administration is almost, if not quite, without precedent. Dr. Bryan has tackled the problem and has done a good job which successors will find difficult to equal.

The style is clear and straightforward, the arrangement logical, the indexing and bibliography satisfactory. Much of the contents is applicable to general hospital administration, and many general hospitals would benefit if more stress were laid upon reassuring and explaining to patients the meaning and significance of routine hospital procedures. Many general hospitals could profit also by increased utilization of occupational therapy among the patients.

Perhaps the omission is purposeful, but one who has had experience in both general and mental hospitals looks in vain for the many points of difference between the two types of hospitals.

This book should prove of distinct value to all hospital administrators and in the education of those who are training to become administrators.

Physical Therapeutic Methods in Otolaryngology. Abraham R. Hollender. 442 pp. St. Louis: The C. V. Mosby Company. $5.00.

The last decade has witnessed the increasing prominence of physical therapeutic agents in the physician's armamentarium. Diathermy, ultraviolet irradiation, x-ray and radium are now in common use in many fields of medicine. The specialty of otolaryngology has been particularly active in the adoption of many of these therapeutic aids, and it is therefore not surprising to find a textbook devoted to the application of these agents to the special fields of diseases of the ear, nose and throat.

Hollender, in a book of 400 pages with 189 illustrations, presents the subject both from the theoretical and practical viewpoint. The first seven chapters, written in collaboration with four other authors, deal with the fundamental physical principles involved in low voltage currents, diathermy, electrosurgery, photothermy, ultraviolet radiation, x-ray and radium. The practicing physician is thus afforded the opportunity to ground himself thoroughly in the modes of action of the various agents employed and enabled to apply them more intelligently.

The second part of the book begins with the application of these physical therapeutic agents to the appropriate clinical conditions, such as furunculosis, eczema, erysipelas and lupus, so far as they pertain to the nose. Consideration is next given in detail to the physical treatment of acute nasal sinusitis. Two chapters are devoted to ionization of simple chronic rhinitis and vasomotor rhinitis—a subject which has recently provoked an extensive controversial discussion. Consideration of diathermy in the reduction of inferior turbinate enlargements and the treatment of chronic sinusitis precede the much debated question of roentgen ray and radium therapy of hypertrophied tonsils. The succeeding chapters deal with electrosurgical removal of the tonsils and pharyngeal lymphoid tissue, and electrosurgical radiation therapy in laryngeal tuberculosis.

The application of physical therapy to otitic disease is then considered, including ionization in chronic otorrhea by the English advocate of this procedure, A. R. Friel. The second part of the book concludes with a discussion of ocular nystagmus and a chapter on hearing aids and their intelligent prescription for the deaf by Horace Newhart.

The final portion of the book begins with a chapter on the endoscopic approach in the application of physical therapy to the upper air and food passages by Chevalier L. Jackson. Two final chapters by Lederer deal with malignant disease and miscellaneous conditions in which one or another of the common forms of physical therapy is applicable.

An appendix contains a glossary of definitions commonly concerned in physical therapeusis.

The book constitutes a valuable aid to practicing otolaryngologists and furnishes a useful guide in a form of therapy that will continue to be utilized more and more with increasing knowledge of its effects.

The Management of Obstetric Difficulties. Paul Titus. 879 pp. St. Louis: The C. V. Mosby Company. $8.50.

The title of Dr Titus's book connotes an unusual consideration of obstetrics, yet in a careful perusal it turns out to be a most excellent textbook, clearly written, well-illustrated, with well-chosen bibliographies. He has materially changed the presentation of his subjects from the usual textbook order, and it does not seem to the reviewer that this change has added to the value of the book. The first chapter is a consideration of the cause and treatment of sterility. Sterility is hardly an obstetric difficulty.

The book is an outstanding contribution to obstetric technic and every chapter reflects careful and painstaking work. It should have a ready acceptance, and if the technic advised is followed, obstetrical practice throughout the country will be greatly benefited.

Operative Surgery. J. Shelton Horsley and Isaac A. Bigger. Volumes I and II. Fourth Edition. 1387 pp. St. Louis: The C. V. Mosby Company, 1937. $15.00.

This book on operative surgery comes out with the new fourth edition in two volumes and with a coauthor, Dr. Isaac C. Bigger. Dr. Bigger is professor of surgery at the Medical College of Virginia.

The book is very well written, beautifully illustrated and practical. Two of the new sections are on chest surgery and brain surgery and are excellent.

There is much to commend and little to condemn in this useful and carefully prepared treatise. It will be particularly helpful to the surgeon as a reference book.

Health Questions Answered. W. W. Bauer. 368 pp. Indianapolis and New York: The Bobbs-Merrill Company, 1937. $2.00.

"Health Questions Answered" is based essentially upon actual questions posed by the laity to the American Medical Association or to its health magazine *Hygeia*. Trivial though some of the questions are, there are others which are thought-provoking and, among these, are many which cannot yet be answered adequately. The answers given are reasonable and well informed.

The subject-matter is very broad, ranging from skin, complexion and hair through many fields of medical practice and of public health. Technical words are explained, wherever used. The style is direct and simple.

With regard to the fact that the public evinces an increasing and serious interest in medical practice and in medical problems, we believe that this book may fill an important need.